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DENISE ANNE CROOK

BA, BSc (Econ)

THE EARLY HISTORY
OF THE ROYAL GEOLOGICAL SOCIETY OF CORNWALL:
1814-1850

Vol 1

Submitted for the Degree of Doctor of Philosophy
of the Department of History of Science and Technology,
Faculty of Arts,
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ABSTRACT

The origins and early membership of the Royal Geological Society of Cornwall, founded in Penzance in 1814, are examined, and it is concluded that the institution was established mainly to provide a source of culture for a middle class group of men; however in the initial years, the Cornish mining industry, in which many of them had investments, was also a major concern. Comparisons are made with a number of similar societies, including the Royal Institution of Cornwall (f.1818) and the Royal Cornwall Polytechnic society (f.1833). It is shown that the RGSC had some similarities with other provincial societies, but two important differences are singled out; specialisation in geology, and the relative unimportance of religious dissent.

Three case studies are presented. The first describes the society's efforts to produce a geological map of Cornwall, and argues that a map published in 1832 was inadequate, and met the needs neither of the society, nor of the mining industry. The second study looks at investigations of mineral veins and a survey of Cornish mines made by W J Henwood, and concludes that although some useful results were presented, these were of little lasting value. The work of R W Fox on the electromagnetic origins of mineral veins is discussed, with attention to the reasons for Fox's presentation of his work to institutions other than the RGSC. The final case study examines the subject of health and safety in mines.

The geological work of the society is described, and it is

concluded that although the Geological Society of London was possibly used as a model, members of the RGSC were prepared to follow more diverse geological interests than were members of the London Society, partly because of the nature of Cornish geology, but also because they initially paid attention to the utilitarian applications of the subject.

To the best of my knowledge, this thesis is my own original work, except where proper reference has been made. Nothing in the thesis has been published elsewhere, nor has it been previously submitted to this or any other University for a degree or any other qualification.

ACKNOWLEDGEMENTS

I wish to express my grateful thanks to the Officers and Council of the Royal Geological Society of Cornwall for allowing me access to their archives and library, and for permitting the microfilming of manuscript minute books etc. I wish particularly to thank the following Officers for their help: Mr Courtney Smale, President, Mr C Halford, Honorary Secretary and Mrs J E Newport, Honorary Librarian (and her "Tuesday ladies"). I must also gratefully acknowledge the assistance of the late Mr Moyle, former Honorary Curator.

My thanks are also due to the many people in Cornwall who have assisted me in my researches: especially Mr Terry Knight and his staff at the Local Studies Library, Redruth, Mr Peter Gilson, Honorary Librarian of the Royal Cornwall Polytechnic Society, Falmouth, the staff at the Courtney Library of the Royal Institution of Cornwall, and the Archivist and staff of the Cornwall County and Diocesan Record Office, Truro. Special thanks are due to the tolerant staff of the St Austell Branch Library who have invariably expedited my requests for inter-library loans.

The photographs in this thesis were taken by Courtney Smale, (Figure 14) and Michael Allaby (Figure 10), to whom I owe my thanks. The map in Figure 18 has been adapted from: K F G Hosking and G J Shrimpton (eds) (1964), Present views of some aspects of the geology of Cornwall and Devon, 150th Anniversary Volume of the Royal Geological Society of Cornwall, Penzance.

Quotations from documents in the care of the Duchy of Cornwall have been made with the permission of His Royal Highness the Prince of Wales, Duke of Cornwall. I wish also to thank the following for permission to use extracts from letters and other manuscripts: the Royal Society (Letters to R W Fox); the County Archivist, Cornwall County Record Office. Quotations from the Hawkins Papers (CRO J) at Cornwall Record Office, and at the West Sussex Record Office (WSRO (H)), are reproduced by permission of Mr A M J Galsworthy, Trewithen, Grampound Road, Truro.

I must express my appreciation of the ever ready help and encouragement of my two supervisors, Professor Colin Russell and Dr Roger Beck, both of the Open University. Finally I cannot thank sufficiently my daughter and son, for without their enthusiastic support, this project could never have been started, let alone completed.

DEDICATED
TO THE MEMORY OF
DAVID JOHN CROOK
(1934-1973)

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ABBREVIATIONS USED IN TEXT

RGSC - Royal Geological Society of Cornwall
 RIC - Royal Institution of Cornwall
 RCPS - Royal Cornwall Polytechnic Society
 BAAS - British Association for the Advancement of Science

ABBREVIATIONS USED IN NOTES AND REFERENCES

CRO - Cornwall County and Diocesan Record Office
 WSRO (H) - West Sussex Record Office, Hawkins Papers
 DNB - Dictionary of National Biography

Bibliotheca Cornubiensis - G C Boase and W P Courtney,
Bibliotheca Cornubiensis: a catalogue of the writings,
both manuscript and printed, of Cornishmen, and of works
relating to the County of Cornwall. with biographical
memoranda and copious literary references, 2 vols.,
 London 1874; Vol. III, (supplementary volume), London,
 1882.

Collectanea Cornubiensia - G C Boase (1890), Collectanea
Cornubiensia: a collection of biographical and
topographical notes, relating to the County of Cornwall,
 Truro.

Munk's Roll - William Munk (1861), The Roll of the Royal
College of Physicians of London: compiled from the Annals
of the College, London.

1 INTRODUCTION

The Royal Geological Society of Cornwall, founded in Penzance, Cornwall in 1814, began its history at a time when other local institutions were also being established elsewhere in England. There had been similar developments in the previous century, the earliest provincial societies with scientific subjects on their agendas being the Lunar Society of Birmingham (f.1750), the Bath Philosophical Society (f.1779) and the Manchester Literary and Philosophical Society (f.1781). The RGSC was therefore not unique in that respect, although it was the earliest scientific society in Cornwall, and was the first provincial institution intending to devote itself to geology exclusively. No other provincial societies of this period had declared that they intended to specialise in geological studies, although several, including the Newcastle Lit and Phil (founded in 1793), had included geological objectives amongst their plans. The second provincial society to devote itself to geology alone was the Yorkshire Geological Society, founded as late as 1837.¹ It is therefore important to look at the reasons for the establishment of a scientific society in Penzance, and to ask why geology should have been singled out for the special attention of members.

The period of the Industrial Revolution in England was a time of rapid developments in the sciences, and the new science of geology had begun to emerge in a modern shape in this country at about the end of the eighteenth century. The foundation and progress of the Cornish geological society was apparently linked to the emergence and growth of the science to which its

members wished to contribute. Geology had earlier roots however, in cosmogony, mineralogy, and mining.² Both mineralogy and mining engineering were already areas actively studied in Cornwall, because of the long history of the exploitation of the metalliferous deposits of the county. Torrens has pointed out the links between the industrialisation of Shropshire and early geological investigations of that county.³ It has long been a question for debate among historians of science whether the growth in science was a cause, or a consequence, of the improvements taking place in British industry, or whether in fact there were no connections between the sciences and the emerging industries.⁴ It will therefore be relevant to ask further questions, such as whether the mining industry of Cornwall had anything to contribute to the new geological society, whether the society attempted to assist the industry, and if so, whether its efforts were successful.

By the start of the nineteenth century two influential schools of geological thought had begun to emerge. The first was associated with Abraham Gottlob Werner and the Mining Academy at Freiberg in Saxony, and was sometimes described as the neptunian school. The second was connected with the followers of James Hutton of Edinburgh, and was known as plutonism. Slightly later, in the second decade of the century, studies made in France on the Paris basin, by Georges Cuvier and Alexandre Brongniart, introduced the detailed study of fossil remains to the new science. They also found that there was evidence of environmental change in the strata which they attributed to catastrophic events, such as flooding. The geological tradition which developed in England at the begin-

ning of the nineteenth century was however remote from both Scottish and continental schools. No coherent school of geological thought was apparent here until the 1820's. However, religion did tend to be more closely associated with geology in Britain than elsewhere.

Was the geological society in Cornwall to become involved in the issues that were central to the growth of early nineteenth century geology, or was it to be more concerned with the utilitarian problems more typical of practical surveyors and miners and several of the provincial societies? The RGSC should have been well situated to contribute to the debate between neptunist and plutonist schools of thought, for the origins of the granites and mineral veins of the county were central to the debate between the conflicting theories. Werner and his followers held that the oldest rocks had crystallised out of primitive oceans, and that the fissures in which mineral ores were to be found had been formed concurrently; plutonists taught that certain rocks, particularly granites and basalts, were formed by the action of heat, and had been injected into pre-existing strata in a molten state, and that many mineral bearing veins had been formed in a similar way. Catastrophism was relevant to studies of placer (fluvial) deposits of tin in Cornwall, and to explanations of the recent sands of the northern coasts of the county, for it was thought that both might have been formed by sudden and severe events. It therefore will be relevant to examine the contributions made by the members of the RGSC to the geology of Cornwall, and to assess whether the proximity of the gran-

ite batholiths and the copper and tin mines was to be an important source of geological inspiration.

In this country, many of the new developments in the sciences were closely linked with the growth of scientific societies, for the universities of England were not noted at that time for their teaching of science.⁵ There were alternative institutions in Britain where an education in the sciences could be followed, the Dissenting Academies and the Scottish universities, and the possible influence of the University of Edinburgh on some of the early secretaries of the RGSC who were graduates of the university will be examined. The first societies to emphasise the study of geology had been the Askesian Society and the British Mineralogical Society, both founded in London, and both comparatively short-lived.⁶ The Geological Society of London, destined to become the forum for much of the best work in geology throughout most of the nineteenth century, was established in 1807. A considerable amount of new knowledge about the geology of their own local areas was also contributed to societies in the English regions by provincial men of science and professional surveyors and mining men, in the first part of the nineteenth century, although the London elite took less notice of their work.

The Geological Society of London initially abjured theory and instead, under the leadership of G B Greenough, advocated the collection of facts and the methods of Baconian induction.⁷ Speculative geology was excluded partly in order to avoid controversy, both within geology (for example, neptunists versus plutonists) and with religion.⁸ Conflict between geol-

ogy and religion had emerged at the end of the eighteenth century. The need for a long time scale for the history of the earth, which was becoming an inevitable consequence of the unravelling of the geological strata, was troubling to those people who believed that it conflicted with the Biblical stories of the creation and Noah's flood. The "scriptural geologists", notably Richard Kirwan and J A De Luc, were those who attempted to reconcile the new geology with Biblical history.⁹ The geological school which emerged in England in the second decade of the nineteenth century, and which was associated especially with the University of Oxford and the work of William Buckland, was linked to natural theology, the study of God's work as revealed by Nature.¹⁰ An examination of the religious beliefs of members of scientific societies is therefore relevant in a study of the Cornish society, not only because their geological ideas could have been influenced by their religious ideas, but also because in several of the new provincial institutions, dissenters constituted a large proportion of the membership.

A study of the Cornish geological society should also assist in shedding light on the development of science in the early nineteenth century in provincial England, and especially on the early growth of the geological sciences. It is also important to identify the similarities and differences between provincial science in Cornwall, and especially Cornish geology, and the science being studied elsewhere in the provinces and in the metropolis at about the same period. Two other important scientific societies were founded in Cornwall not

long after the geological society, and their development and their relationships with the RGSC will also be examined, in order to help to elucidate the progress of science in Cornwall.

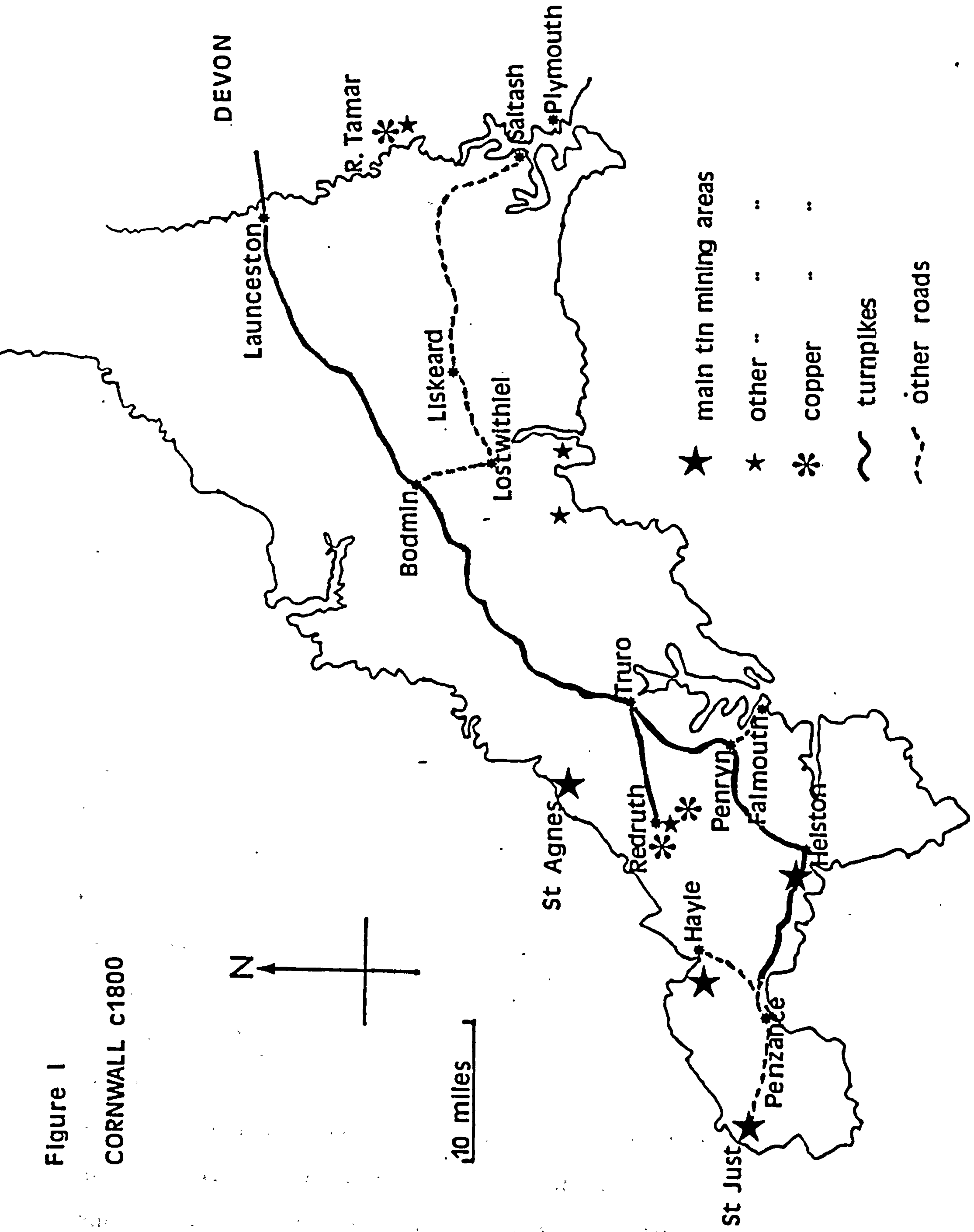
This thesis will concentrate on the early history of the Royal Geological Society of Cornwall, in particular on approximately the first thirty five years up to about 1850. This was a period of particular interest, both in the evolution of scientific societies, and for geology. Documents which record the early history of the society have been preserved in its archives, and permission was given to microfilm them. There are some gaps in the minute books and other papers, most of which, as will be shown, were most probably due to contemporary failures to record meetings; however sufficient material has been available to enable a fairly complete picture of the first years of an important Cornish institution to be developed.

NOTES AND REFERENCES

1. Morrell (1983, 1988).
2. Laudan (1987).
3. Torrens (1990).
4. Cf. C A Russell (1983), (96-113); Thackray (1974).
5. Roderick (1967), (11).
6. Inkster (1977): Weindling (1983).
7. Rudwick (1963).
8. Porter (1977), (214-5).
9. Gillispie (1951), (41-72).
10. Rupke (1983).

Figure 1

CORNWALL c1800



2 THE ORIGINS OF THE CORNWALL GEOLOGICAL SOCIETY

2.1 Cornwall before 1814

Cornwall at the end of the 18th century was an important industrial area, with major mining interests. Both tin and copper were mined, the western end of the county being the more important area (see Figure 1). Subsidiary activities, such as banking and tin smelting, served the mines. Until about the third quarter of the 18th century, the county was self-supporting in agricultural production; the main products were barley, wheat and potatoes. Increasing population meant however that by the end of the century there was no longer enough locally produced food, and this was combined with poor harvests. There was industrial unrest, and riots caused by food shortages took place in several years.¹

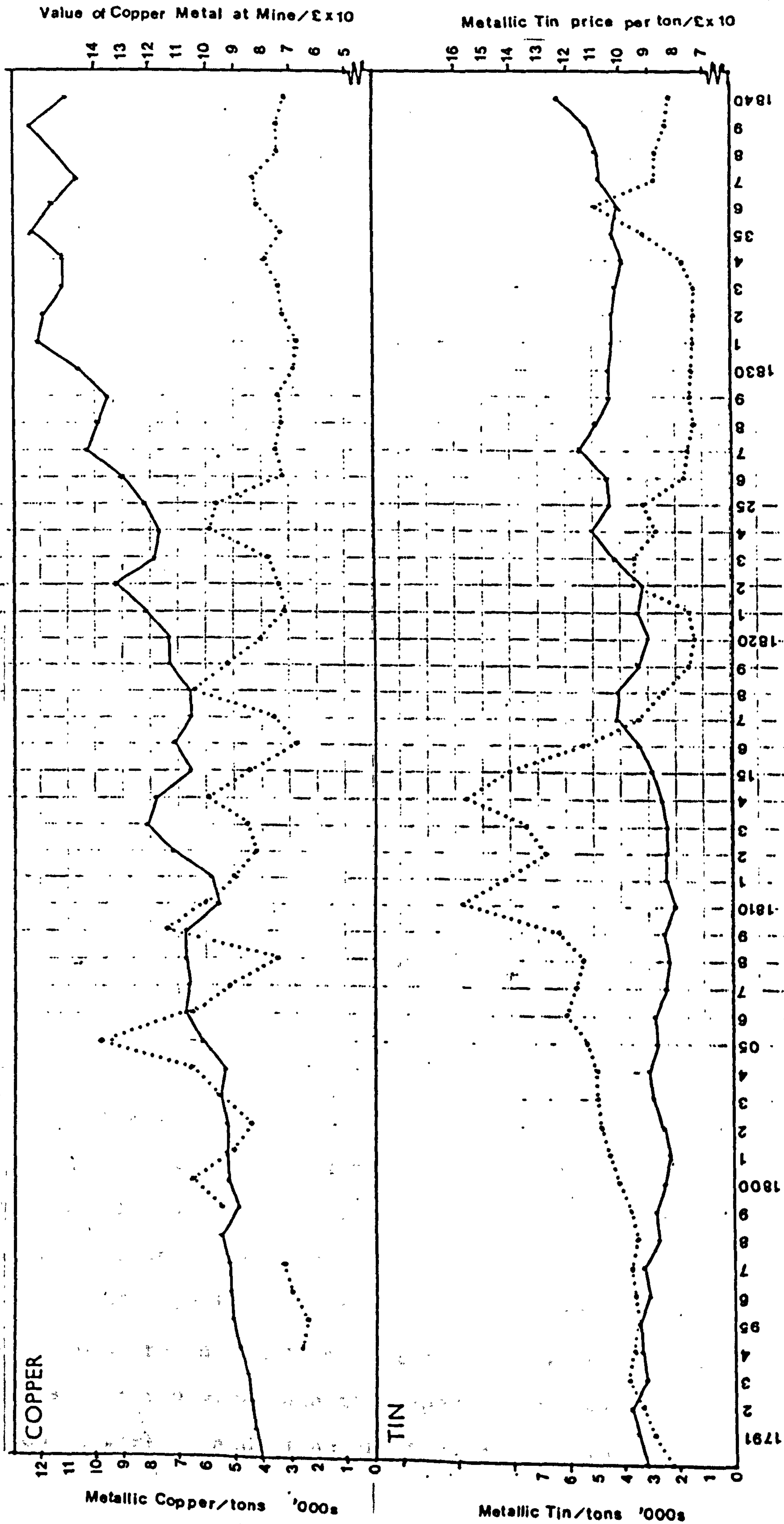
In the late 18th century copper mining suffered competition from the Parys Mountain Copper Mine in Anglesey until these deposits were exhausted, by about 1792. After the start of hostilities against the French, demand for copper grew, for guns, for the issue of copper coins in the period 1796-1806, and for the sheathing of warships with copper.² Production of tin also was influenced by market changes. The use of pewter tableware declined as pottery took its place, but growing demand from the Welsh tin-plate industry at least partly mitigated this decline, as did the invention around 1771 of Britannia Metal with a tin content of 90%.³ The war years were generally times of prosperity for the metalliferous mines, but copper produced more profits than tin. Up to half the production of metallic tin had been exported to the con-

FIGURE 2

(for details see Appendix 2)

production

prices



tinant before markets were closed by the war; an agreement to sell tin to the East India Company at a fixed, but low price did not compensate fully for the loss of these markets.⁴ (See Figure 2 and Appendix 2.)

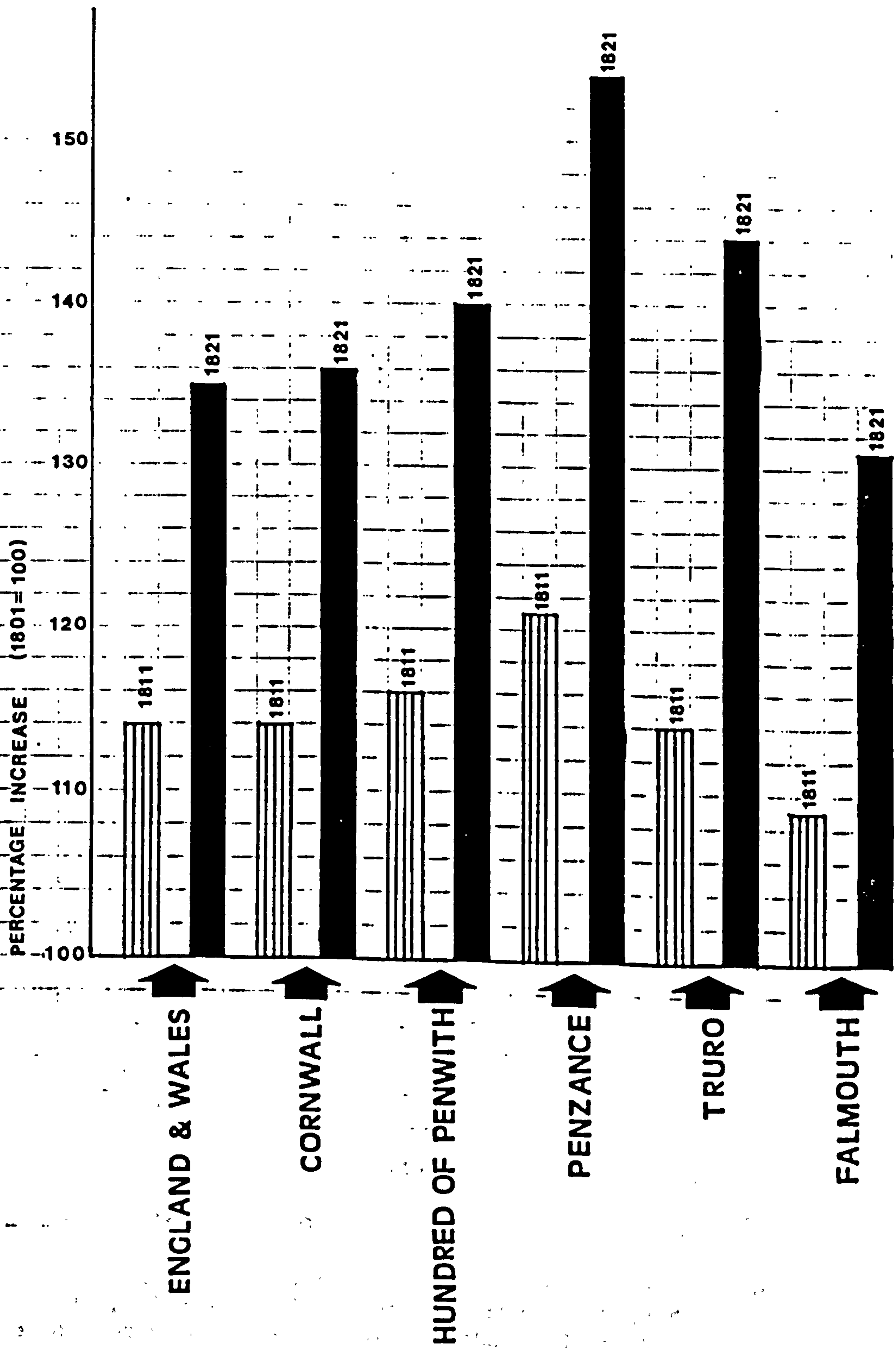
Population growth in the county was rapid at this time. Figure 3 and Appendix 3 show how the population of Cornwall grew in the first part of the 19th century, and how growth rates were similar to those of England and Wales as a whole. Individual areas within Cornwall however experienced fluctuating populations, as a result of movement into or out of towns and parishes. This was caused mainly by migration of the mining community, as miners moved to areas where labour demands were high. One of the secretaries of the RGSC, John Forbes, calculated that in the Penwith area the population of mining communities had increased by 33% over a period of 15 years in the beginning of the 19th century, whereas the agricultural villages had grown by only 19%.⁵

Cornwall's position at the far end of the western peninsula resulted in isolation. Roads were exceptionally bad, for many were churned up by the mule trains which carried coals and ore to and from the mines. Only towards the end of the eighteenth century was the building of turnpike roads begun (see Figure 1). Thomas Thomson wrote in 1818: "the roads in Devonshire and Cornwall...are by far the worst which I have seen in any part of Britain".⁶ Transport by sea was therefore important, across the Bristol Channel to South Wales for the import of coal for the mines and the export of copper ore to the Welsh copper works, and along the English Channel to the

FIGURE 3

COMPARATIVE POPULATIONS (percentages)

(also see Appendix 3)



south coast ports and London. After the outbreak of war with the French, this latter route became dangerous, and an alternative sea journey via Bristol was sometimes used.⁷

Cornwall had been regarded with opprobrium by many in the rest of the country in the earlier part of the 18th century; its reputation for lawlessness, especially among the mining community, must have been effective in deterring the less adventurous. Towards the end of the century however the religious teaching of the Wesleys had had a significant effect in curbing some of the wilder activities (such as drunkenness and smuggling) of the miners and fishermen. When the continent became closed to travellers by war, Cornwall became one of the more favoured alternatives, especially for invalids, because of its mild climate.

2.1.1 Intellectual Life in Cornwall before 1814

Cornwall made hesitant steps to form learned societies towards the end of the 18th century. The year 1792 saw three developments all of which presaged the later formation of a geological society in Penzance and the institutions founded in Truro and Falmouth.

The first was the Cornish Mining Society. The following extract from the only existing document relevant to this society described the intentions of the founders:⁸

At a meeting of several Agents Captains and others concerned in Mines, the various Societies formed in this Kingdom for the encouragement of different Arts and Sciences, Agriculture &c, from which the Community at large have received

great advantage, became the chief subject of conversation. It was humbly submitted that a Society formed for the general improvement of Mining would not only cause the present Mines to be worked in a better manner but would tend to future discoveries to the great emolument of the Lords, Adv^{'rs}, and the commercial interest of the County of Cornwall in particular, and the public in general.

No other references to this meeting have been found in newspapers, or elsewhere, and it seems possible that only the one meeting took place. The original document contained a blank space where the salary of the secretary should have been entered, which also supports this argument. (The entire document is reproduced in Appendix 4.) It is not known who the agents and captains referred to were.

The second development concerned a proposal to form a County Library, Museum and Literary Society in Truro. On the 25th September 1792, seven gentlemen met together at the Red Lion in Truro to discuss this proposal, and agreed to call a public meeting on 25th October. Among these seven were three who would later become members of the RGSC: Sir William Lemon, the Chairman of the Truro meeting, Sir Christopher Hawkins and Sir Francis Basset (later to become Lord De Dunstanville). None of the seven were to join the Royal Institution of Cornwall at Truro in its early days.⁹ Printed letters were sent out to selected people in Cornwall, describing the plan for an institution and inviting them to attend the meeting:¹⁰

Establishments of the same nature have succeeded in various places both at home and abroad... from small beginnings Collections of this nature have quickly swelled into immense Libraries. Those of Manchester and Birmingham of no long standing, contain many thousands of volumes... The specimens of Fossils, Ores, &c repositied in the Museum, will show the rich variety of nature... The Monthly Meetings... will direct the attention to whatever is immediately interesting in Literature or Affairs... One may surely then be justified in hoping that not only Gentlemen and Ladies who reside near the Library, but those at a distance, will contenance and

support an Institution of such general utility, and in which not only the Interest, but the Reputation and (if I may use the expression) the Glory of the County of Cornwall are concerned.

A subscription list appended to this invitation showed that £182-14-0 had already been raised in entrance fees and annual subscriptions. Of the 27 names listed, 10 would later become members of the geological society in Penzance; these included Davies Giddy and Sir John St Aubyn.¹¹ Despite the ideas of the initiators of this plan, the institution which eventually grew from the original meeting functioned only as a library.¹²

The third development was the foundation of an Agricultural Society in Bodmin, designed to serve the whole county. The initial meeting was held on 1st December 1792,¹³ and the originator of the proposal was named as Sir William Molesworth of Pencarrow, near Bodmin. Of the original subscribers, only two would become members of the RGSC; this perhaps reflects the location of the Agricultural Society which was well to the east of the main mining area. By 1813 however, 29 of the 184 subscribers were also to be members of the RGSC.¹⁴

Between 1792 and 1814, there seem to have been no further moves to found learned societies, although local agricultural societies, on the Bodmin pattern, were established in some parts of the county, including the Hundred of Penwith. A number of friendly societies were also set up, and dispensaries opened in Penzance and Falmouth. Concern about war in Europe may have delayed the formation of scientific and literary societies, while institutions such as dispensaries, which appeared to be more directly benevolent, would have

received priority.

2.2 Penzance at and before 1814

Penzance was affected by the industrial developments within Cornwall. The town's population grew rather more rapidly than that of the remainder of the county (see Figure 3 (p.11) and Appendix 3). Some of the increase must have been due to the migration of workers into the area, attracted by the industries associated with mining, especially tin smelting. Account must also be taken of an influx of visitors in search of better health.

Penzance was not itself a mining town, although it was the centre for the mining areas of St Just and St Ives. Its main industries were the shipping trade (exporting fish and minerals, and importing coal and other supplies needed for mining), pilchard fisheries, rope making, tanneries and boot and shoe makers.¹⁵ There were also the three-monthly tin coinages. J S Courtney, in a paper in the Annual Report of the Royal Cornwall Polytechnic Society for 1839, stated that Penzance served as a market for up to 30 000 people from the Penwith area.¹⁶

Comparable towns were Truro, itself a coinage town, and the centre of the Stannaries, and Falmouth, a packet and fishing port. Launceston and Bodmin were Assize towns, but were very much smaller than Penzance and Truro. Only Launceston however grew at a rate similar to Penzance. Bodmin in the early part of the 19th century was a declining town, as will be seen.

Several writers of the eighteenth and early nineteenth centuries referred to the prosperity of Penzance.

[Penzance] is a place of good business, well-built and populous, has a good trade and a great many ships belonging to it... There are also a great many families of gentlemen.

Daniel Defoe (1724) ¹⁷

Penzance is a large and populous town surrounded by a well cultivated and beautiful tract of country. Notwithstanding its exposure to the sea, the corn... seemed to be in a remarkably thriving state... The mildness of the air, the agreeableness of the situation, and the respectability of its inhabitants render Penzance particularly inviting to residence; and, with regard to invalids, it may justly be considered as the Montpellier of England.

Why then should not this climate be as beneficial to invalids as that which they are generally sent across the Channel to enjoy?

W G Maton (1797) ¹⁸

The mildness of the climate of this place has rendered it for many years past the resort of that happier description of invalids on whom fortune has bestowed the power of seeking health... a more pleasing retreat cannot be found than Penzance.

Rev Richard Warner (1809) ¹⁹

The last author quoted did wonder however whether many of the invalids were so very fortunate, after observing the many tombstones in St Mary's Chapel yard that recorded deaths from consumption.

Local writers also commended Penzance: ²⁰

[Penzance] in every respect, is the most eligible residence [the stranger] can select... he will meet with every accommodation requisite with facility and all satisfaction...

The Town... is rapidly improving; handsome houses are rising in commanding situations... and we must not forget the Chalybeate springs which rise in the neighbourhood.

J A Paris (1816)

Other evidence for growth and improvement in Penzance is shown by the building of many of the streets in the area around St Mary's Chapel. South Parade was started in 1790, North Parade in 1815, and Regent Terrace in 1820.²¹ Most were houses suitable for middle class occupiers. An advertisement typical of several that appeared in the Royal Cornwall Gazette for 1813 suggests that some of these houses were built to accommodate visitors.²³

To be let for six or twelve months, on reasonable Terms, a handsome House, completely furnished, well calculated for the accommodation of a large family, pleasantly situated in PENZANCE, commanding an extensive view of the Mount's Bay, and country adjacent.

The following extract from a long poem by C V Le Grice, with the title "The Petition from an Old Uninhabited House in Penzance to its Master in Town", compared Penzance with the declining town of Bodmin:²²

If Penzance, like Bodmin Town,
 Look'd like one great tumble-down,
 Where the buildings, one and all,
 Bend in sympathetic fall;
 In such fellowship of grief
 My sorrow might find some relief;
 But now, from Back to Betty's Lane,
 From Morrop Stile to Ponsandane;
 From north to south, from east to west,
 Where Jennies spin, or Hides are drest;
 Elliot's Square, and Will Toll's Bakehouse,
 Humphry's Shop and Phillpott's Cakehouse;
 Woolcock's Back-let, Market-jew Street,-
 Everywhere, 'tis like a new street.

...

Say, say ye Gods, is this Penzance?

C V Le Grice (1811)

Penzance made special efforts to accommodate the visiting invalids. In 1814, hot and cold sea water baths were built at the instigation of J A Paris, the resident physician. Davies Gilbert, later President of the Geological Society, was also

concerned to aid the town. His good friend, John Hawkins, wrote to Sir Christopher Hawkins, his brother, thus:²⁴

Davies Giddy has applied to me lately for the plans of a bathing machine which is to be built by subscription at Penzance for the use of those strangers who frequent the place. Penzance he says is becoming every year a place of greater resort and new buildings are erecting there.

Penzance seems to have had little to offer in the way of intellectual diversions before 1814, but there were facilities for amusement and entertainment. Assembly balls had began in 1770, and new rooms for these functions were opened in 1791. In 1787 a theatre offering plays and musical entertainments was built at the Union Hotel.²⁵ C V Le Grice wrote in 1803:²⁶

We have cards for the sedentary, books for the lounge, balls for the light-heeled, clubs for the convivial, and picnics for the gay and thoughtless.

Little else was available, as was described in the following extract, from an account by a local man, Henry Boase:²⁷

...at that time Penzance afforded very little help towards the acquisition of knowledge, no bookseller, no public library, no reading room, no scientific or benevolent institutions of any kind, and except a little occasional stir by the novel introduction of Methodism, there was nothing to disturb the long established smoking, drinking and gaming clubs...

A Ladies' Book Club was formed in 1770, but the main fare seems to have been popular novels. A Gentleman's Book Club with apparently similar resources was in existence soon after.²⁸ In 1799 the Gentleman's Subscription Newsroom was opened. A rather different activity was offered by the Penwith Agricultural Association, founded in 1799, on similar lines to the Cornish Society based at Bodmin, and providing Annual Exhibitions.²⁹ The opening in 1809 of Penzance's Dis-

pensary was attributed to a visitor, "Mr W H Hoare of London", whose family donated 45 guineas. This institution was however designed for the relief of local people.³⁰

2.2.1 Industries associated with mining in Penzance

Penzance provided two important services associated with mining: tin smelting and banking; it was however less important to the copper mining industry than Truro, for few of the major copper mines were to be found in the far west of Cornwall. Under Stannary law, all Cornish tin had to be smelted within Cornwall, and could only be sold at the three-monthly coinages. Nearly two-thirds of the tin ore from the immediate area was smelted in houses belonging to Penzance businesses (see Table 1 and Figure 4).

Banking was closely associated with smelting, for tin from the mines could be paid for only after assay and sale at a coinage. Miners began to rely on the "cheques" issued by smelters, which they circulated as alternatives to bank notes when they needed to make payment for mining supplies. These "cheques" were promises of payment for ore delivered to a smelting house; full settlement was deferred until after the coinage. This practice led eventually to the establishment of conventional banks, by partners in tin smelting houses.³¹

Three banks were opened in Penzance in the period 1795-1810 and all were associated with smelting (see Table 1): these were the Penzance Bank (1795) belonging to Batten and Co, the

Mounts Bay Commercial Bank belonging to the Bolitho family, founded in 1807, and Dennis, Sons and Company (1810).³²

TABLE 1

OWNERSHIP OF TIN SMELTING HOUSES IN THE PENZANCE AREA

TIN SMELTING HOUSES IN THE PENZANCE AREA	NO. OF BLOCKS ¹ SMELTED IN 1815	PROPRIETORS 1815
Trereife	2 087	*Batten
Ludgvan	2 129	Wallis and Tyacke ²
Chyandour	2 144	*Oxnam, Bolitho
Treloweth	2 329	Daubuz
Angarrack	2 726	*Carne, Cunnack, ³ Bolitho, Pascoe
Total	11 415	
Tin smelted in other parts of Cornwall	6 827	
	18 242	

*Penzance based businesses

Sources: All except details of partners in Angarrack from: Barton (1967).

1. A 'block' of metallic tin weighed 300-400 lb (John Rowe (1953), (47)).

2. Ludgvan was bought by the Bolitho's in 1819.

3. Higgans (1979-80), (49).

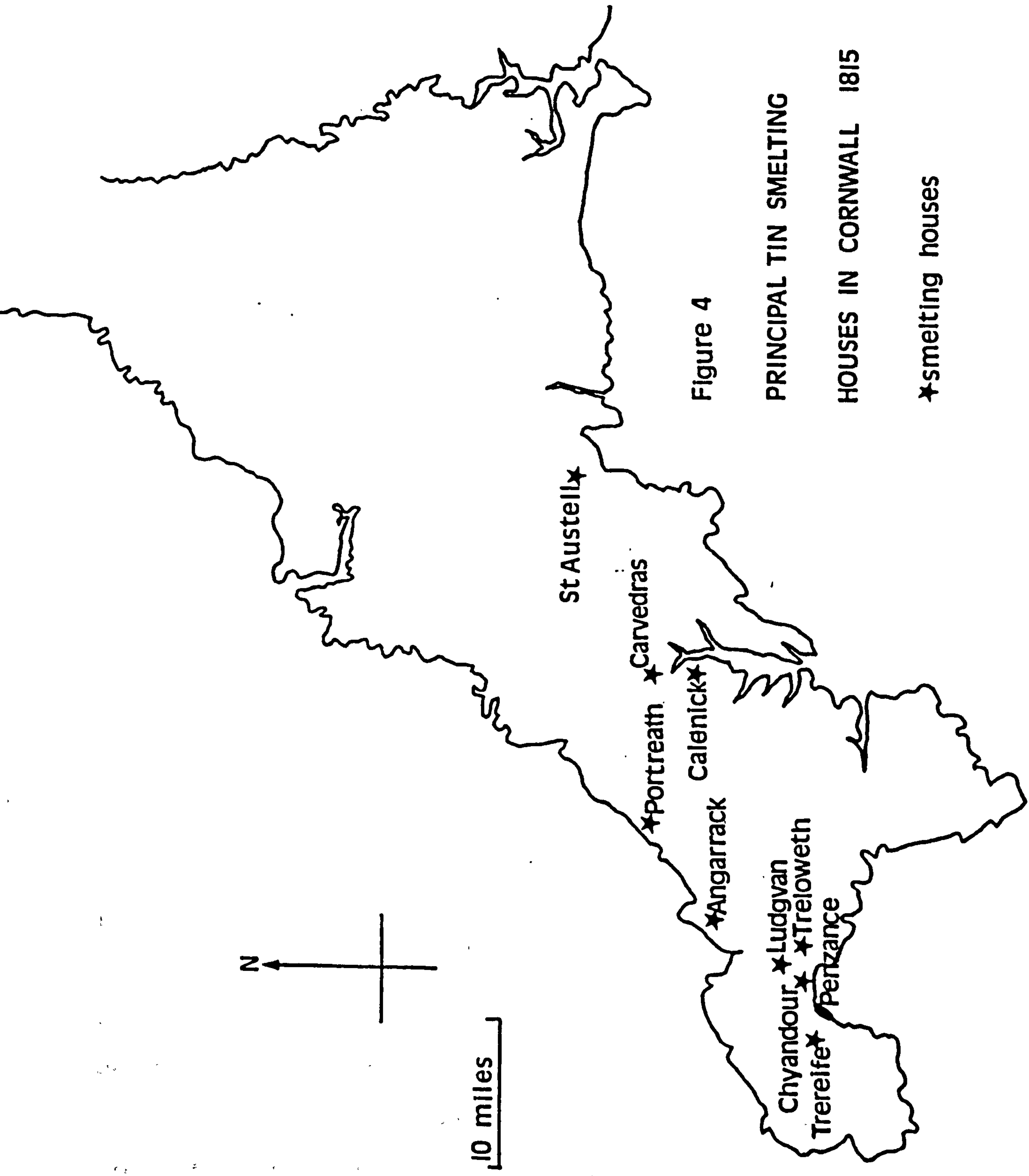


Figure 4

PRINCIPAL TIN SMELTING

HOUSES IN CORNWALL 1815

★smelting houses

2.3 The origins of the Cornwall Geological Society

The Cornwall Geological Society (CGS), the first scientific society in the county, was founded in Penzance in 1814. Both of the other two major towns in Cornwall, Truro and Falmouth, were experiencing population growth and prosperity similar to Penzance, and set up their own scientific societies a little later (the Royal Institution of Cornwall in 1818 in Truro and the Royal Cornwall Polytechnic Society in 1833 in Falmouth). Philosophical societies had already been founded in a number of other towns, especially those in the north of England associated with industry. Cornwall must be included among the industrial areas of the early 19th century because of its production of metals. Two literary and philosophical societies had already been started closer to home, in Plymouth in 1812, and in Exeter in 1813; therefore Cornwall was perhaps tardy in joining in this movement. Cornish towns were however very much smaller than most of those in which societies had already been founded. Penzance had a population of only 4 022 in 1811 (see Appendix 3), whereas Plymouth had 50 263 inhabitants, and Exeter, 18 896. The northern towns were also more populous, for Manchester had a population of 94 876 in 1801, and Newcastle, 27 578 in 1811.³³

1814 would have been a propitious year for the foundation of a new scientific society in Cornwall. By 1814 there were definite signs that the long war on the continent was coming to an end; the army of Napoleon had been conclusively defeated in October 1813, and by February 1814 had withdrawn to within the old frontiers of France. In Cornwall especially this brought

increased prosperity, for as soon as European markets were reopened, fish and tin could again be traded with continental countries. Tin and copper mines reached a peak of prosperity in 1814; the copper standard stood at £128, higher than it had been for five years, and production of ore was at a new record level. The price of tin was at an equally high point, and production was increasing (see Figure 2 (p.9) and Appendix 2). 1813 had been a good year for agriculture in the whole country, and the price of wheat had fallen from 152s to 75s a bushel.³⁴ This atmosphere of prosperity was however very shortlived, as metal prices rapidly fell again after 1814 (see Figure 2 and Appendix 2), and there was a succession of bad harvests.

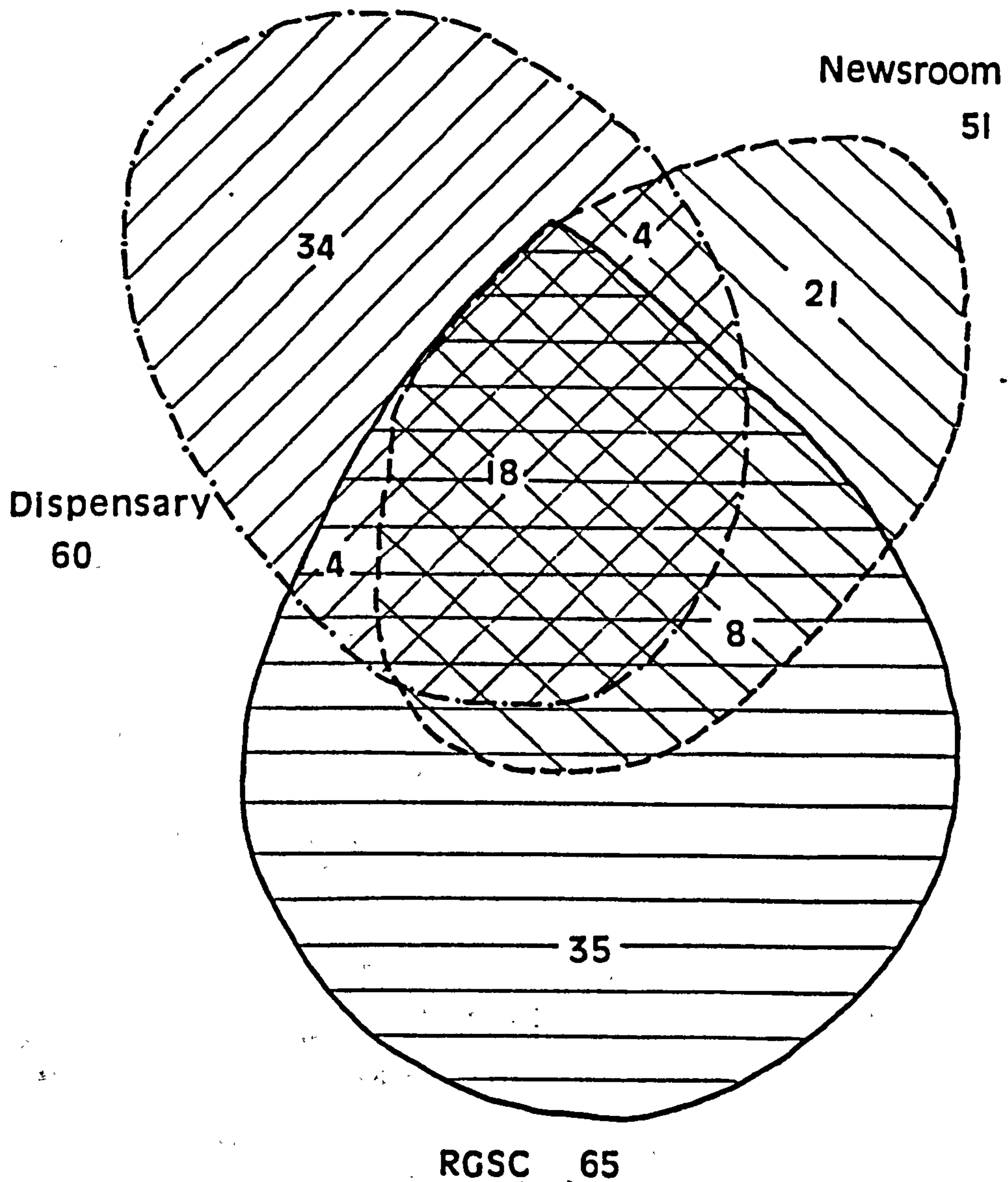
As suggested above, Penzance was one of the more successful Cornish towns of this period, but it was not unique. Truro was the centre of business for Cornwall, especially for the copper trade, and the place of residence of the Vice-Warden of the Stannaries. Many of the county gentry had their town houses in Truro, and there was an active social life, with a theatre, assembly balls etc.³⁵ The town was home to the Cornwall County Library, founded in 1792 (see Section 2.1.1). Truro was a coinage town like Penzance, although by the beginning of the nineteenth century the quantity of tin coined at Truro was considerably less than that coined at Penzance.³⁶ Truro had also lost its position as a sea port to Falmouth in the eighteenth century, when the river Fal silted up and sea-going vessels could no longer reach so far up the river.³⁷

Falmouth was important as a package port, handling mails and passengers; some of the latter stayed in the town waiting for vessels to arrive. It also had a large pilchard fishery. These activities had been severely affected by the war with France and the consequent disruption of Channel shipping, but by 1814 had begun to revive. Falmouth had a theatre, assembly rooms, and a dispensary opened in 1806.³⁸ The smaller port of Flushing, on the opposite side of the Penryn river, was a resort for invalids.³⁹ The leading members of the town of Falmouth were liberal Quakers, the Foxes, who owned a bank, shipping company, iron foundry, etc. They were generous benefactors of the dispensary and a Lancastrian school established in the town.⁴⁰ Truro and Falmouth were therefore very similar to Penzance in population and social life. There must therefore have been other factors which led to the foundation of the first Cornish scientific society in Penzance.

There were, before 1814, a number of clubs and organisations in the town at which groups of men could meet socially or for business. Many of the members of these groups were also to become members of the CGS (see Appendix 1 and Figure 5). The Penzance Dispensary, opened in 1809, was run by a Board of Governors. Sixteen of the men who had at some time served as Governors were to become founding members of the CGS, as were six of the Dispensary Officers, physicians, surgeons and apothecaries.⁴¹ The Gentleman's Subscription Newsroom, started in 1799, was another meeting place for some of the citizens of the town, especially business men. They would have been able to read about the new societies formed in Plymouth and Exeter in the local newspapers supplied there, and also could have

FIGURE 5

OVERLAPS IN THE MEMBERSHIPS OF
THE ROYAL GEOLOGICAL SOCIETY OF CORNWALL;
PENZANCE GENTLEMAN'S SUBSCRIPTION NEWSROOM
AND PENZANCE DISPENSARY, 1814



seen coverage of the activities of Lit and Phils in industrial areas of the north. Twenty six of the 51 Newsroom subscribers were also founding members of the CGS.⁴² The extract from the "Memoirs" of Henry Boase, quoted below, referred to a meeting which took place in the Newsroom at which the first idea of forming a society was proposed. Penzance Town Council was also well represented in the geological society, for eight of the men who served as Mayors of the Borough of Penzance in the period 1800-34 would become members.⁴³ This suggests that there were common interests among many of the founding members of the CGS, and that several of them were used to meeting regularly together. There must however have been similar groups with common interests in the other Cornish towns.

Henry Boase, in his "Memoirs" written in 1824, described how he remembered the geological society had come into being:⁴⁴

Our only public lounge then was the newsroom. ..there I sometimes met [Dr Paris and Ashhurst Majendie] and it happened on a rainy afternoon in the early part of the year 1814 that the conversation turning on Mr Majendie's immediate pursuits he remarked the mining district of Cornwall was so rich in mineral productions of the greatest curiosity, that he wondered that there should be no School of Mines nor any scientific establishment to promote the study of mineralogy. To me, mineralogy and geology were at that time as unknown as Chaldee or Arabic, but I knew that the establishment of any Scientific Society was likely to be beneficial and therefore earnestly recommended the attempt.

All three feared indeed that there was little prospect of procuring members enough to form an Institution, but we agreed to canvas our acquaintances and the result was a far more general success than was expected. Such was the simple origin of the Royal Geological Society of Cornwall.

If this account is reliable, for it was written ten or more years after the events described, three men were initially responsible for the formation of the CGS. John Ayrton Paris had arrived in Penzance in July 1813, to take the place of

the local physician, John Bingham Borlase, who had died in May.⁴⁵ Paris had come from the Westminster Hospital, where he had worked as a physician, having been educated at Cambridge and Edinburgh. His patron, William Maton, was responsible for recommending him "to some influential gentlemen" in Cornwall to fill the vacancy left after Borlase's death, and had also supplied him with letters of introduction.⁴⁶ Maton had travelled in Cornwall in 1794, and also acted as physician to a number of Cornish MPs when they were resident in London. Paris was already a member of a scientific institution in London, the Linnean Society, to which he had been introduced by Maton.⁴⁷

In Penzance, Paris almost certainly had free time which he could use to the advantage of a new society. The work of Dispensary physician took less than two days a week, and there is other evidence to suggest that he did not find his private practice too demanding.⁴⁸ He was an ambitious man and would have welcomed the publicity, both local and national, which the post of secretary to the RGSC would bring him. It is likely that he would have made use of Maton's letters of recommendation, in order to further his career, both as physician and as secretary of a scientific society.

Ashhurst Majendie was a young gentleman from Essex, of Huguenot extraction, who stayed in Penzance from about 1813 to 1815.⁴⁹ He had been educated at Edinburgh, where he had qualified as a barrister, but had also studied geology there.⁵⁰ Little is known about him, but Boase described him as "a

gentleman devoted to geological pursuits", and suggested in his "Memoirs" that he and Paris had known each other at Edinburgh.⁵¹ It is not known why Majendie should have spent over a year in Penzance, although Boase suggested that he "was induced to remain a considerable time" by "so rich a field for mineralogical investigations".⁵² As will be shown below, accounts of his activities in the minutes of the RGSC suggest that he had sufficient leisure time available to devote to the new society.

Henry Boase was a native of Penzance, but had lived and worked in London for about twenty years, before returning to Penzance in 1809. He had enjoyed the cultural life and the easy access to libraries in London, and the company of men such as Granville Sharpe and Robert Owen, and missed such activities in Cornwall.⁵³ Boase would have known most of the influential men in and around Penzance, for he worked as a banker, and also served on the Board of Governors of the Dispensary.

Paris argued that it was the environment that made the choice of Penzance inevitable for a geological society. In his speech at the first meeting of the RGSC, he finished with the following explanation:⁵⁴

...It remained for him only to show why Penzance should be preferred to Truro or some other more central town as the place of [the society's] establishment. It was its proximity to an extensive and interesting coast which rendered Penzance so desirable, as well as it being surrounded by mines of most singular geological interest.

It might have been expected that Penzance would have followed the example of other towns and formed a more general literary

and philosophical society. Few societies specialising in one science had been formed at this time, especially in provincial towns. Certainly Henry Boase might have been happier promoting such a society, for judging by the quotation from his "Memoirs" used above, he knew nothing of geology.

Penzance however took much pride in the achievements of Sir Humphry Davy. The town's connections with Davy might suggest that a chemical society would have been more appropriate, and there was another reason why chemistry might have been the choice for a specialist society, for Paris had lectured in pharmaceutical chemistry to students at the Westminster Hospital, and had published a syllabus of those lectures.⁵⁵ He also gave chemistry lectures to members of the RGSC in the winter of 1814-15.⁵⁶ He claimed to have known nothing of geology before his arrival in Cornwall, writing in 1818: "The pursuit of the science commenced with my residence in this interesting county, and it must terminate with it".⁵⁷ This statement does not however seem strictly accurate as he is said to have attended mineralogy lectures by Clarke at Cambridge, and by Playfair in Edinburgh. He also described attending at least one of Davy's Royal Institution lectures on geology.⁵⁸

There were of course close links between chemistry and mineralogy, so that training in chemistry would have included some mineralogical techniques. The Rev William Buckland wrote in 1820, in Vindiciae Geologicae:⁵⁹

Geology is likewise separately allied to an extensive branch of Chemistry, inasmuch as the latter science derives exclusively from the mineral kingdom no small proportion of the

materials which form the basis of its experiments: and on the other hand, it is so largely indebted to the results of chemical analysis, that without them its fundamental science Mineralogy could scarcely ever have existed...no person can understand the elements of Mineralogy without a knowledge of Chemistry at least more than superficial...

Davy also had argued that the basis for geological understanding should be mineralogy and chemistry.⁶⁰ Davy was known to his contemporaries as a geologist, as well as a chemist, for he had been a founding member of the Geological Society of London, had lectured at the Royal Institution on geology, and had made excursions to Scotland and Ireland in search of geological specimens.⁶¹

Of the three men named in Boase's extract, Ashhurst Majendie was the one with the greatest geological knowledge. He read the first paper presented to the society and, until he left the county, was one of its most active members.⁶² Soon after leaving Cornwall, he travelled on the continent, and spent part of his time visiting continental geologists, and on field work.⁶³ It may be therefore that the interest and enthusiasm of Majendie was the determining factor in the choice of type of society.

There would however have been other valid reasons for the appeal of geology, for it had become a fashionable science at about the beginning of the 19th century. It was attractive to amateurs, who enjoyed collecting minerals and fossils, and could combine appreciation of landscape and scenery with more serious study of rocks. Cornwall is a county of particular interest to geologists and mineralogists, with good coastal exposures of rock, and mining areas with collectable minerals.

The mines were visited regularly by mineralogists and geologists from London and the Continent.⁶⁴ The main rocks in Cornwall are granites and shales; these, at the start of the 19th century, were thought to be primitive formations, and thus of special interest to those geologists who took part in the debate between neptunism and plutonism. The granite veins on St Michael's Mount had been examined on several occasions by visiting men of science in search of an explanation of their origin, either from heat or water: some of the more recent visitors had included Professor Hailstone, J F Berger and Thomas Thomson.⁶⁵ The scenery in Cornwall is also attractive, and would have appealed to those who preferred to walk or sketch, following the lead of Romantic poets like Coleridge and Wordsworth, and perhaps especially Sir Humphry Davy who wrote verses about his native area. Penzance's curate, C V Le Grice, who had been at school with Coleridge, and who thought of himself as a minor poet, introduced some of these ideas into his speech at the initial meeting of the new society:⁶⁶

We may, said he, adopt in part the expression of the Poet,

'Nature to our eyes her ample page,
Rich with the spoils of time has here unroll'd.'

The 'ample page' is unrolled, it is open before us; but with how few readers, and with how few commentators!

Robert Bakewell had also referred to the connection between geology and the enjoyment of nature in his Introduction to Geology (1813):⁶⁷

It may be advanced as an additional recommendation to the study of geology, that it leads its votaries to explore alpine districts, where the surrounding scenery and the salubrity of the air conspire to invigorate the health, and give to the mind a certain degree of elasticity and freshness, which will enable them on their return to discharge with greater alacrity the duties of active and social life.

Although Cornwall cannot be described as "alpine", the references to health would have appealed to Paris and other medical men, for Penzance served as an alternative to continental health resorts.

Although geology as such was a comparatively young science, its antecedents, especially mineralogy and mining, were not new to Cornwall. In the previous century, two books had been published which had included substantial sections on the mineralogy and mines of the county: The Natural History of Cornwall (1758), by William Borlase, a clergyman from Ludgvan, near Penzance, and Mineralogia Cornubiensis (1778) by William Pryce, a Redruth surgeon. Contributions to Cornish geology had also been made in the past by continental philosophers and mining engineers as will be shown.

Paris, in his initial speech to the nascent society, argued that mining was particularly important to the county, and should therefore become a relevant field of study for members:⁶⁸

It was [geology's] application to the Art of Mining which rendered this Science so highly interesting to the respectable Assembly he had the honour of addressing. The success of this Art came home to the Business, and Bosom of every Gentleman present.

At the same meeting, Davies Gilbert, the newly elected President, also referred to the advantages to mining that a such a society might bring; "He doubted not [a geological society] would...very greatly promote the Mining Interests of the County".⁶⁹ Members of the CGS with financial interests in mining may have hoped to benefit from the society's activ-

ities. Many had such interests, either directly as adventurers, or as mineral lords (who took a share of the produce of the mineral bearing land which they owned), or as bankers, smelters and merchants, who serviced the industry (see Section 3.2 below). The quotation below by the President of the Board of Trade was used on the cover of the first edition of the Laws of the society, and on the title page of early editions of its Transactions. This was a reminder of how important mining and its wealth were to many of the members.⁷⁰

A knowledge of our subterranean wealth would be the means of furnishing greater opulence to the Country than the acquisition of the Mines of Mexico and Peru.

Despite the importance apparently attached to mining at the time of the foundation of the geological society, it will be argued in later Sections that the mining community took little interest in its progress after the first few years, and that, with only a few exceptions, the society did nothing to advance the prosperity of the industry. It will also be shown that the membership of the society was predominantly middle class, that the nucleus of active contributors was small, and there were only a few members with much prior knowledge of geology. It must be concluded that, despite the rhetorical reasons given in some of the addresses at the initial meeting, the real reasons for the foundation of the society were to fill a cultural gap in the lives of the citizens of Penzance, and as an addition to the attractions available to its visitors.

2.4 The initial meeting

The first meeting of the new Geological Society was held on

the 11th February 1814, at the Union Hotel in Penzance. If Boase's account, quoted in Section 2.3 above, is accepted as a correct version of what happened, there would have been little time in which to get organised, once the decision had been made on that rainy day in the "early part of the year 1814". Yet, according to the account of the meeting given in the West Briton for 25th February 1814, "the names of upwards of 70 gentlemen were immediately given as subscribers". There were in fact 65 names listed at the front of the first Minute Book. The meeting was well organised, with speeches by Paris, C V Le Grice (the Perpetual Curate of Penzance), and Davies Gilbert. A Patron, Lord De Dunstanville, was chosen. A set of Laws had been prepared in advance by Paris, and these were accepted without alteration by the members.⁷¹ Many of the gentlemen went on to a dinner which had been ordered at the Union Hotel.⁷²

Gilbert, in a letter to Daniel Lysons, author of the Cornish volume of Magna Britannia, stated that the meeting had been advertised.⁷³ However for reasons explained below, Gilbert's account of the first days of the society may not be fully reliable. Neither of the two papers published in Truro (the West Briton and the Royal Cornwall Gazette) carried any relevant advertisement for the society, nor did the Western Luminary (Exeter) or the Sherbourne Mercury. No pamphlets or handbills have been found.

Boase's account stated that "we agreed to canvas our acquaintances". It seems likely that this was the method used to advertise the meeting, and that most of the canvassing was

FIGURE 6

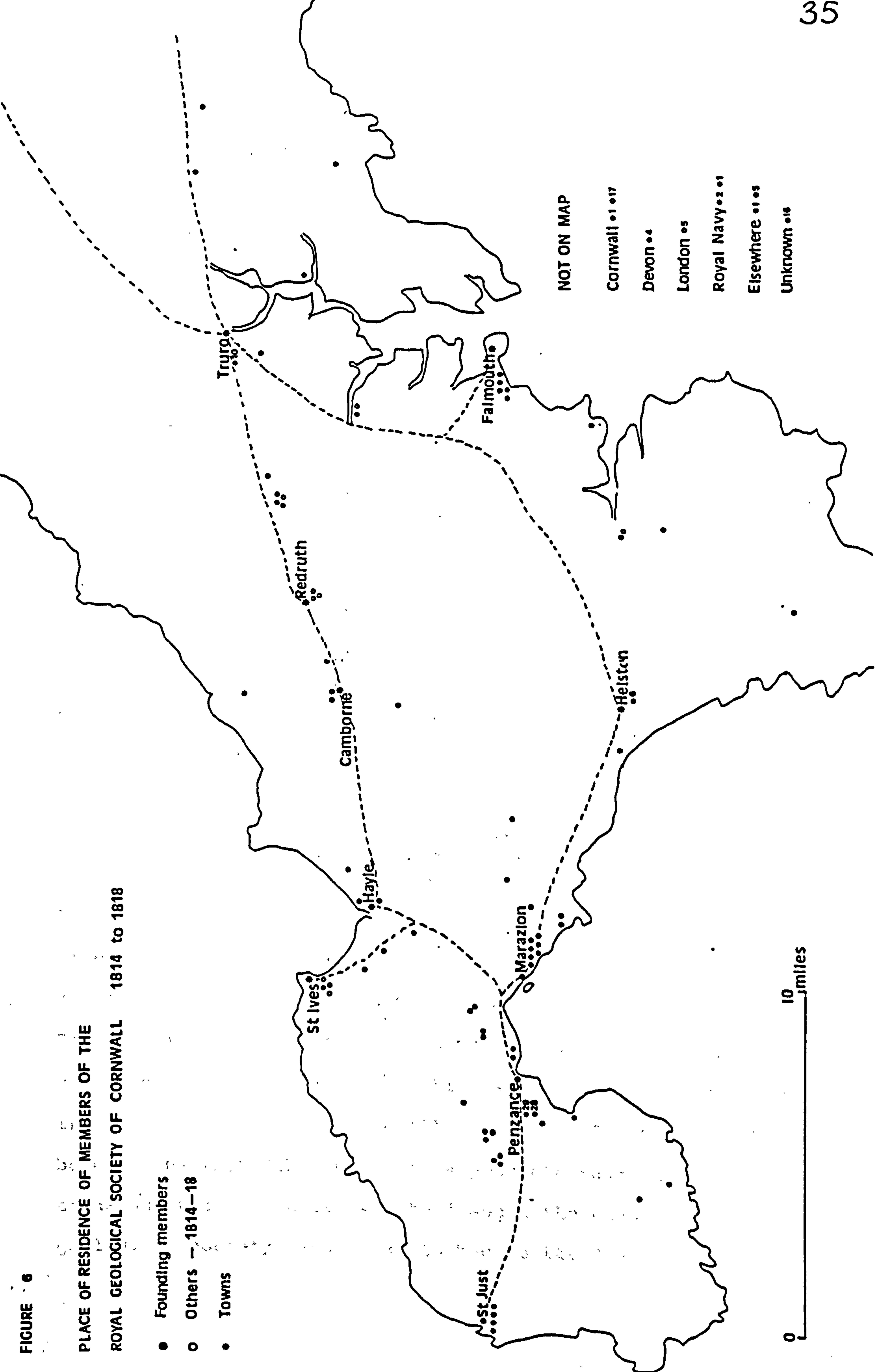
PLACE OF RESIDENCE OF MEMBERS OF THE

ROYAL GEOLOGICAL SOCIETY OF CORNWALL 1814 to 1818

● Founding members

○ Others — 1814—18

• Towns



done by word of mouth, as the majority of the new members lived within easy reach of Penzance (see Figure 6), and a good number of them would have met together at the Newsroom, or at meetings, or in the course of business. Searches of the correspondence of those founding members whose personal papers are available in collections have failed to reveal relevant letters. The first Exhibition of the Polytechnic Society, held in Falmouth in 1833, was also advertised only by word of mouth, and was very successful.⁷⁴

Gilbert left records of his activities and the people he met in his Almanacs, in which he made entries almost daily. Unfortunately, in late 1813 and the early months of 1814, he was preoccupied with the terminal illness of his father, who died on 6th March 1814, and the Almanac for early 1814 recorded daily changes in his father's health, to the exclusion of almost everything else. The record for 11th February was typical:⁷⁵

I attended at the formation of a Mineralogical Society at Penzance. I was elected President. Returned immediately after dinner, my poor Father appeared to me rather worse.

The Almanac also recorded on 25th January, that the surgeon attending the Rev Edward Giddy had recommended that Dr Paris be called in "on account of the increased swelling of my Father's legs". On the following day, the 26th January, Paris came and stayed to dinner.⁷⁶ This was the only recorded meeting in early 1814, or late 1813, between Gilbert and Paris before the 11th February. It is possible that it was on this occasion that Gilbert was told about the plans to form a geological society, and asked to become its President.

Davies Gilbert was elected President at the first meeting. The choice was a natural one. He was respected as a local land-owner, as an MP (for Bodmin), and as a man of science. He was a Fellow of the Royal Society, and a member of the Geological Society of London. He was known to give help to young men who showed an interest in the sciences, of whom the best known was Sir Humphry Davy. He could therefore be expected to give positive support to the new society, and had sufficient status to hold the office of President.

The CGS began with an informal meeting with only three people present, and it progressed rapidly to become an established institution with 65 founding members, and a total of 136 by the end of 1814. None of the members were ladies, although they were very welcome to attend meetings, and were present in large numbers at each Anniversary Meeting.

The prefix "Royal" was adopted at a Special Meeting of the society on the 15th October 1814, when it was announced that the Prince Regent had agreed to become the Patron of the society. He had been approached by Lord Yarmouth, the Lord Warden of the Stannaries, on behalf of the members at the instigation of Lord De Dunstanville.⁷⁷ It is not known who initially suggested that the Prince Regent should be asked to become Patron, but it is likely that part of the reason for the approach would have been because of the Prince's interest in the county, in his role of Duke of Cornwall. He received a considerable income (around £16 000 per annum) from his estates and mineral rights in Cornwall, and from the coinage

dues on tin.⁷⁸

NOTES AND REFERENCES

1. Rowe (1953), (231).
2. Rowe (1953), (112), and Gayer et al. (1973), (708).
3. Rowe (1953), (48, 165).
4. Gayer et al. (1973), (707).
5. John Forbes (1834), I, (107).
6. Thomas Thomson (1818), (353).
7. See for example the references to the shipping enterprises of the firm of Harveys, in Vale (1966).
8. Cornish Mining Society, CRO M 255/6.
9. Details of the meeting at the Red Lion are given in the Cornwall County Library 'Committee Minute Book No.1' 1792-1841 CRO X 15/1. The names of men at this meeting are compared with membership lists for the RGSC (1818) and RIC (1818-35).
10. Notice concerning Cornwall Library &C, 1792, CRO T 3066.
11. Davies Giddy. Davies Giddy took the surname Gilbert in 1816, in order to comply with the will of his wife's uncle, so that he could inherit his estate; see entry in Davies Gilbert's Almanac, for 1st December 1816, CRO DG 20. This thesis will use the name "Gilbert", except in transcriptions of manuscripts earlier than 1817, where the wording of the document will be followed.
12. See Cornwall County Library Committee Minute Book No.1 1792-1841, in which the only business transacted at most meetings was to approve lists of books to be purchased: CRO X 15/1.
13. Notice of Meeting to form an Agricultural Society, 1792, CRO AD 592/12.
14. Cornwall Agricultural Society, Rules and Orders &c, 1813, CRO AD 592/22.
15. Laws (1978), (16,36).
16. Courtney (1839), (32).
17. Quoted in Chope (ed) (1967), (165).
18. Maton (1797), (194, 210).
19. Warner (1809), (146).

20. Paris (1816), (12,15).
21. Pool (1974), (185).
22. Rev C V Le Grice (1811) quoted in Polwhele (1831), (99).
23. Royal Cornwall Gazette 15th May 1813 (3).
24. Letter to Sir Christopher Hawkins, from John Hawkins 2nd April (no year) CRO J 2246C/17.
25. Pool (1974), (119).
26. C V Le Grice in a letter to the Royal Cornwall Gazette 1803, quoted in Pool (1974), (119).
27. 'The Memoirs of Henry Boase 1824', in C W, G C & F Boase (1876), (5).
28. Pool (1974), (119).
29. Document in Eva Mss. RIC Courtney Library.
30. Edwards (1945), (2).
31. Armstrong (1937), (110-111).
32. Collectanea Cornubiensia.
33. Census figures.
34. Gayer et al. (1973), (111, 115).
35. Douch (1977), (120).
36. Barton (1967), (43).
37. Pounds (1945), (380).
38. Thomas (1815), (57, 65).
39. Thomas (1815), (90).
40. Brett (ed) (1979), (13, 148).
41. Penzance Dispensary, Minute Book 1809-1828, CRO X 439/1.
42. Gentleman's Subscription Newsroom, Penzance, Minutes etc 1806-35, CRO X 529/4. The newsroom had 36 subscribers, plus temporary members who subscribed for one month or more; in 1813-4 there were 15 temporary members.
43. Pool (1974), (281).
44. Parts of Henry Boase's Memoirs were reproduced in C W, G C & F Boase (1876). The extract quoted here was not included, and appears only in two almost identical manuscripts in the Eva Collection. One of these, dated 16.12.52 by the local historian C Eva, carries the inscription "From Memoirs of Mrs

L P Butterfield's Great Grandfather dated 2nd November 1825 and copied by her". It has not been possible to trace the original manuscript of Boase's Memoirs. Mss in Eva Mss, Courtney Library, RIC.

45. Royal Cornwall Gazette 31 July 1813.

46. Munk's Roll, III, (121).

47. Paris (1838).

48. For the duties of the Dispensary Physician, see Edwards (1945), (6). For a reference to the "insignificance" of the private work in Penzance see a letter to Canon Rogers from Majendie, 11th June 1817, in Rogers Family Autograph Collection, II, CRO RP 17/75.

49. These dates are those on which he commenced and relinquished his subscriptions to the Newsroom. Minutes of Gentleman's Subscription Newsroom, Penzance CRO X 529/4.

50. Entry for Majendie in Frederick Boase (1892-1921).

51. Memoirs of Henry Boase, in Eva Mss. RIC Courtney Library.

52. Ibid.

53. C W, G C, and F Boase (1876), (7); Eva Mss, RIC Courtney Library.

54. First meeting, 11th Feb 1814, RGSC Minute Book No.1.

55. Paris (1811).

56. RGSC Minute Book 1.

57. Paris (1818D), (199-200).

58. For Clarke, see entry for Paris in DNB; for Playfair see entry for Paris in Munk's Roll, III: for attendance at a Davy lecture, see Paris (1831), (306).

59. Buckland (1820), (9).

60. Siegfried and Dott (1980), (xxx).

61. Siegfried and Dott (1980), (xiii-iv).

62. Six papers given by Majendie were recorded in RGSC Minute Book No. 1, of which four were reproduced in Transactions, Royal Geological Soc., Cornwall, I, 1818.

63. Letter from Majendie to Canon Rogers, Rogers Family Autograph Collection CRO RP 17/75.

64. These had included M Jars in 1765, Maton, Thomas Thomson, and at a later date, Elie De Beaumont (Minutes of the Quarterly Meeting held on 10th November 1823, RGSC Minute Book No.1).

65. The visits of these men are described in: Hailstone: letter from J Hailstone to John Hawkins, 18th September 1791, British Museum (NH), Hawkins Mss. (Sir Arthur Russell Bequest, Mss. Cup.2 HAW/156-7. Berger: Berger (1811); Thomas Thomson: Thomson (1818).
66. Initial Meeting, RGSC Minute Book No.1. The quotation was freely amended from Gray's 'Elegy written in a country churchyard', and should have read:
"But knowledge to their eyes her ample page
Rich with the spoils of time did ne'er unroll."
67. Bakewell (1813), (22).
68. Initial meeting, 11th February 1814, RGSC Minute Book No. 1.
69. Ibid.
70. Laws &c of the Cornwall Geological Society, 1814.
71. Initial meeting, 11th February 1814, RGSC Minute Book No.1.
72. West Briton 25th February 1814.
73. Lysons Correspondence British Library Add. Mss. 9416-20, quoted in Todd (1959), (179).
74. Pearson (1973), (45).
75. Davies Gilbert, Almanac for 1814, CRO DG 19.
76. Ibid.
77. Minutes of a Special Meeting held on 15th October 1814, RGSC Minute Book No.1.
78. Barton (1967), (70), and Rowe (1953), (197).

3 THE RGSC AND OTHER SOCIETIES: ORIGINS AND MEMBERS

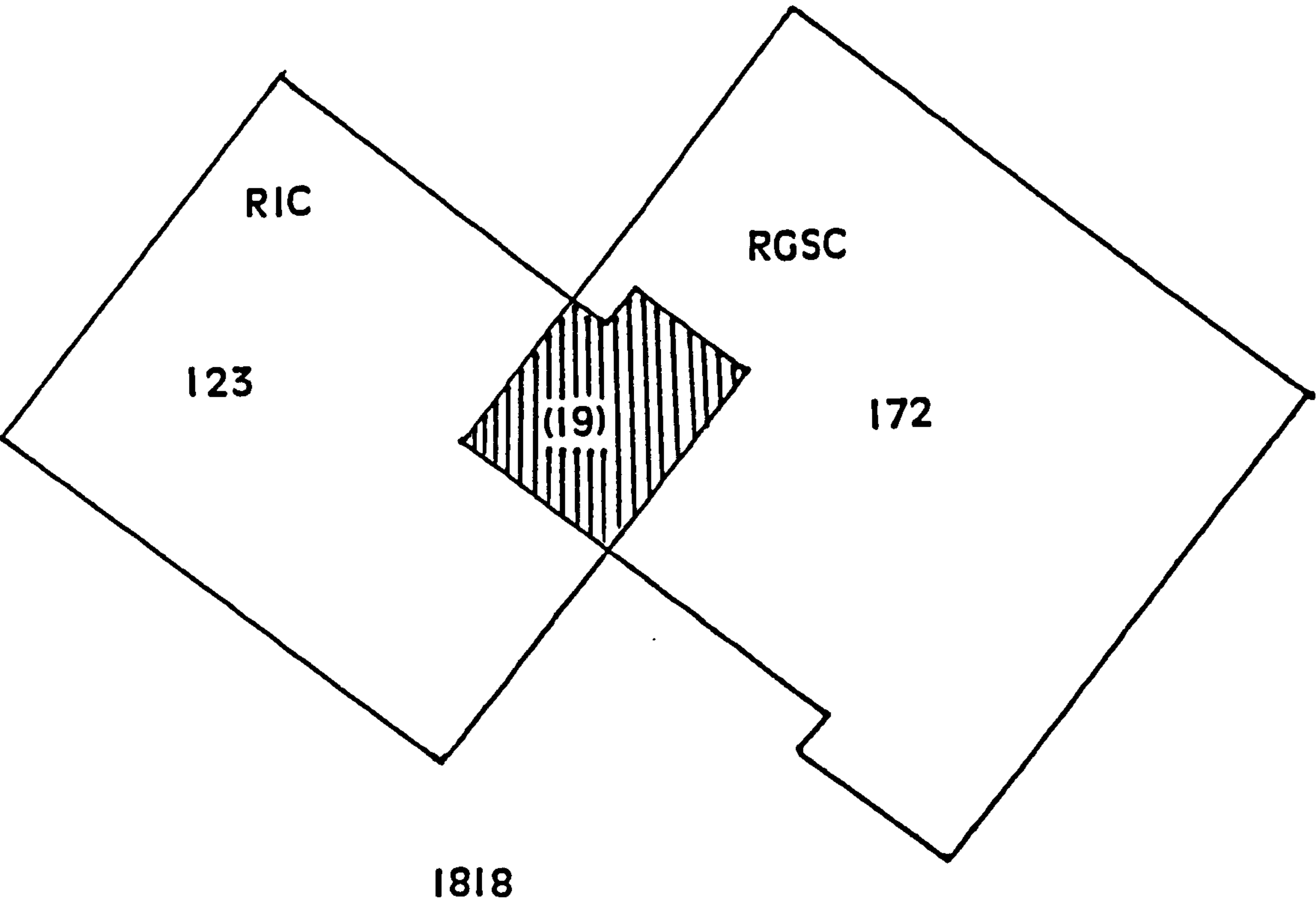
3.1 The origins of other societies

In this section, the Penzance Geological Society will be compared with the two other major scientific societies which were established in Cornwall in the nineteenth century, and with the Plymouth Institution, in order to point out the similarities and differences between them, and to investigate any connections between these local institutions. The origins of the societies formed in Truro and Falmouth were different in several respects from those of the Royal Geological Society of Cornwall.

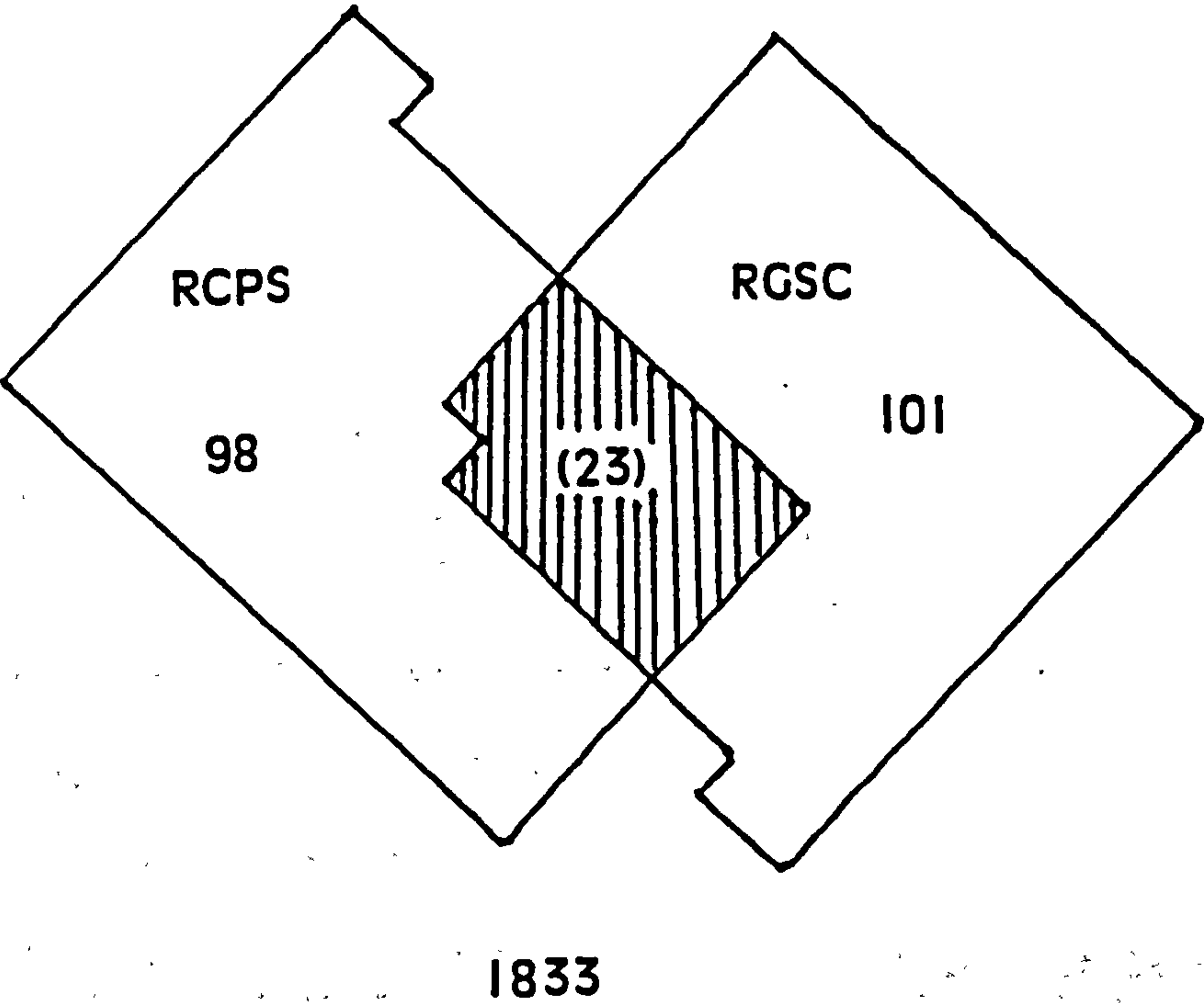
3.1.1 Royal Institution of Cornwall (f.1818)

The Royal Institution of Cornwall at Truro was founded on lines similar to Lit and Phils elsewhere in the country, despite the word "Institution" in its title. It had no need however to establish a library as others had done, since the Cornwall Library, described in Section 2, was already in existence, and would develop a close relationship with it. There were however only tenuous links between the RIC and the Library for the first few years after 1818. Freeborn states that the RIC "started officially with the meeting of a few gentlemen in the Truro Library, on Thursday 5th February 1818, pledging to set up a society for the purpose of 'the Advancement of Science'".¹ The published Rules of the Institution (1818) suggest that this February meeting was rather more formal; there was a Chairman, J H Vivian, and a set of resolutions was adopted, which included details of the types of

Figure 7
CORNISH SOCIETIES — MEMBERSHIP COMPARISONS



hatched areas show common memberships



membership to be offered.² Vivian was also one of the Committee members of the Cornwall Library at the time. Later in 1833, when the Library was experiencing a crisis over funding, it was invited to move into the RIC building.³

The original title of the RIC, "The Cornwall Literary and Philosophical Institution" was adopted in March 1818.⁴ It was altered to "The Royal Institution of Cornwall" in 1821, after the presentation of a petition by Sir Richard Hussey Vivian (the brother of J H Vivian) to George IV, asking him to become Patron.⁵ It is possible that the RIC copied the example of the RGSC in seeking Royal patronage. The Truro society had 123 subscribers by the end of 1818, of whom 16 were ladies.⁶ Of those subscribers, 19 were already members of the RGSC in 1818 (see Figure 7).⁷

The establishment of a new society in Truro was regarded with some apprehension by at least some of those involved with the Penzance society. Paris, after his return to London in 1817, kept in touch with Cornish affairs, and wrote to Henry Boase in March 1818:⁸

I was much gratified at seeing so respectable a meeting at your Geological Society. I begin to entertain some hopes that the bantling will live. What effect will the Truro Society have upon it?

He was rather more frank about his fears for the RGSC when writing to another member of the society, the Rev John Rogers, the Rector of Mawnan (near Falmouth):⁹

I read a long account of the new Institute at Truro, it is surely hostile to the views of the Geological Society, and, should it be successful, must, ultimately, be the means of overturning it.

I received a letter from Mr J H Vivian who expresses a

different opinion, and trusts that it will not [sic] have the effect I anticipate. It would have been better to have removed our Society to Truro?

It is not known what reply Rogers made, if any, but Henry Boase seemed to have had few worries about the Penzance society, for he wrote in March 1818 in reply to Paris:¹⁰

We consider the Institutions at Truro and Falmouth as scions from the parent Stock and calculated to promote Science and be advantageous and creditable to the Geological Society. Depend on it the bantling will not only live but thrive and prosper.

Henry Boase's forecast was the more accurate, at least for the immediate future, as the RIC had to fight against debt and lethargy for nearly two decades, whereas the RGSC continued to attract most attention as the senior Cornish society until about the mid-1830's.¹¹ Boase wrote again to Paris in January 1820:¹²

Our Geological Society still flourishes, notwithstanding the attempt to sap its foundation; and alienate the support of the County, by the formation of the Truro Society, which I understand is not likely to survive another year. From what I have read and heard, if I were to speak honestly, I never knew a Society with less pretensions.

3.1.2 The Royal Cornwall Polytechnic Society (f.1833)

The origins of the RCPS are rather different from those of the RGSC and RIC. A preliminary meeting to set up this institution was held in the Classical School Room at Falmouth in April 1833, the initial object being to arrange the details for an exhibition of arts, inventions, etc, to be held on the 23rd December in Falmouth.¹³ The Quaker sisters, Anna Maria and Caroline Fox, then aged 17 and 14, are often credited with the idea of such a society, although their father Robert Were Fox and his brother Charles were the main organisers in the

initial stages. Pearson suggests that the Cornwall Horticultural Society (f.1832) was the inspiration as it had included "Cottagers' Prizes" at its Annual Exhibition.¹⁴

At a meeting on 20th December 1833 the purpose of the Polytechnic's annual exhibition was stated to be: "to stimulate the ingenuity of the young, to promote industrious habits among the working classes, and to elicit the inventive powers of the community at large...", through the presentation of prizes for the best exhibits.¹⁵ The RCPS had no intentions at first of becoming a copy of other scientific societies, in Cornwall or elsewhere. Its primary objective was to promote self-help, by encouraging inventions, and through the information which was to be imparted in its Annual Reports. The Annual Report for 1835 explained the reasons for this decision:¹⁶

To convert it into an institution, having for its sole object the advancement of science, would be to divert it from some of its best purposes, and, by withdrawing a large portion of the interest, which its popular character has cumulated round it, would, without doubt, greatly diminish its capabilities of promoting the cause of science itself, and might possibly endanger the very existence of the society.

By 1838, the Society had modified its objectives a little, possibly partly because it was felt necessary to recognise the scientific work done by Robert Were Fox, which was being published in its Annual Reports (see Section 6):¹⁷

Though indulging in inquiries of scientific interest, the Society has always recognised as its principal aim and pursuit, those speculations, the practical tendency of which is to abridge the labour and ameliorate the condition of the working classes.

Another unusual feature of the Royal Cornwall Polytechnic Society was the inclusion of women on its Committee; ten, including Anna Maria Fox, were among the 30 people who made up the 1833 Committee.¹⁸ In later years, a separate Ladies Committee was formed. Out of a total of 98 Annual Subscribers in 1833, 23 were also members of the RGSC (see Figure 7 (p.43)).¹⁹ This society followed the example of the two other Cornish institutions in seeking Royal patronage. After the death in 1835 of the Polytechnic's first Patron, Lord De Dunstanville, Davies Gilbert was requested by the members to approach William IV, and ask him to become Patron.²⁰

As will be shown in later sections, by the time the Polytechnic Society was established, the activities provided by the RGSC had diminished. Monthly meetings had been abandoned, as it had been found impossible to sustain a regular programme, and few quarterly meetings were held.²¹ By the end of the 1830's the Polytechnic Society had become the foremost Cornish society, with a greater attendance at its exhibitions than the RGSC had at its Anniversaries, and with more visitors from outside the county. In 1841, when the British Association for the Advancement of Science met at Plymouth in late July, the RCPS rearranged the date of its Annual Exhibition to follow on immediately afterwards, so that many of the men of science could come down to Falmouth and take part. The RGSC did not make any changes to its own dates, and held its Anniversary at its usual time in the autumn.²²

Two attempts were made to establish more formal relations between the three institutions in Falmouth, Penzance and

Truro, in the fifth decade of the 19th century. In 1841, it was decided that the three senior societies in Cornwall should co-operate in collecting meteorological observations, which would be made at various locations in the county.²³ Two members of the RGSC were listed in the RCPS records, as having responsibility as "Observers" in Penzance, although there was nothing in the RGSC records to suggest that it had acceded to this suggestion.²⁴ In 1842, a proposal was made by Dr Charles Barham of the RIC that the three senior Cornish societies should unite to form an "Association of Cornish Societies". Although each would preserve some independence, joint meetings would be held three times a year, in Truro, Falmouth and Penzance successively. He spoke of:²⁵

...the advantages likely to result from more frequent opportunities for communication and discussion on subjects of interest to the County... He attributed the failure of the attempts made by one or other of them separately to compass this end to the fact, that neither of them taken singly was strong enough for such a purpose...

The proposal appears never to have gone any further, as no mention of it can be found in the minute books of the RGSC, nor in its Annual Report. The RCPS Minute Book contained a reference to a proposal from the RIC for "some system of co-operation between the local and the County Institutions", and a recommendation that the secretary write to the RGSC and RIC on the matter, but there was nothing further on this subject.²⁶ It is possible that the officers of the RGSC and the Polytechnic society may have taken offence at the suggestion that their efforts had failed. The distances between the towns were however most probably the more effective deterrent to closer co-operation, for railway links in Cornwall had yet to be completed.

3.1.3 The Plymouth Institution (f.1812)

The Institution in Plymouth had been established before any of the Cornish societies, and it might have been expected that it would have provided a model for the later Cornish foundations, especially the first, the RGSC. There is no direct evidence however, that the Cornish societies were aware of its existence. The Plymouth society was most similar to Lit and Phils elsewhere in the country. The 1827 copy of its Laws began: "This society originated in 1812, in the laudable endeavours of a few gentlemen to promote the cultivation of useful knowledge, by encouraging habits of research, and affording opportunities to persons of various pursuits to communicate with each other, by the reading of essays on literary and scientific subjects".²⁷ 'An Historical Sketch' of 1858 gave the date of formation as 1813; it said that "a little band of gentlemen" who had become used to meeting informally at each others' houses, and later at the Plymouth Dispensary, decided to form a society; the first formal meeting for this purpose was held on 30th September 1813.²⁸ The most important activity of this society was to be a lecture programme; in 1828 the building of a museum was begun, and in 1829, a library.²⁹

There appears to have been little formal contact between the Plymouth Institution and the Cornish societies, although a small number of Plymouth men, including the secretary Henry Woollcombe, became corresponding members of the RGSC and the RCPS. R W Fox was an Honorary member of the Plymouth Institution in 1830, and two members of the RGSC were listed among its corresponding members.³⁰

.....

The RGSC differed from other societies in becoming a specialist geological society very much earlier than all others, except the Geological Society of London. It preceded by 15 years the Newcastle Natural History Society (which despite its name gave a large amount of time to geology), and the Manchester and Yorkshire Geological Societies by more than twenty years. Later sections will include discussion of other points of difference between the RGSC and similar institutions.

The RGSC had 136 members by the end of its first year, and by 1818 had achieved its highest 19th century total of 172. By 1840, the 25th anniversary of the society, the number of members had declined to 110, although the Treasurer's Report suggested that 116 subscriptions had been paid (see Figure 8 and Appendix 12). The RCPS overtook the RGSC soon after it had been established, listing 382 annual subscribers by 1840.³¹ The RIC was less well supported, having only 92 subscribers in 1839, although by the end of the 19th century it had become the most important society in Cornwall.³²

3.2 The founding members of the RGSC

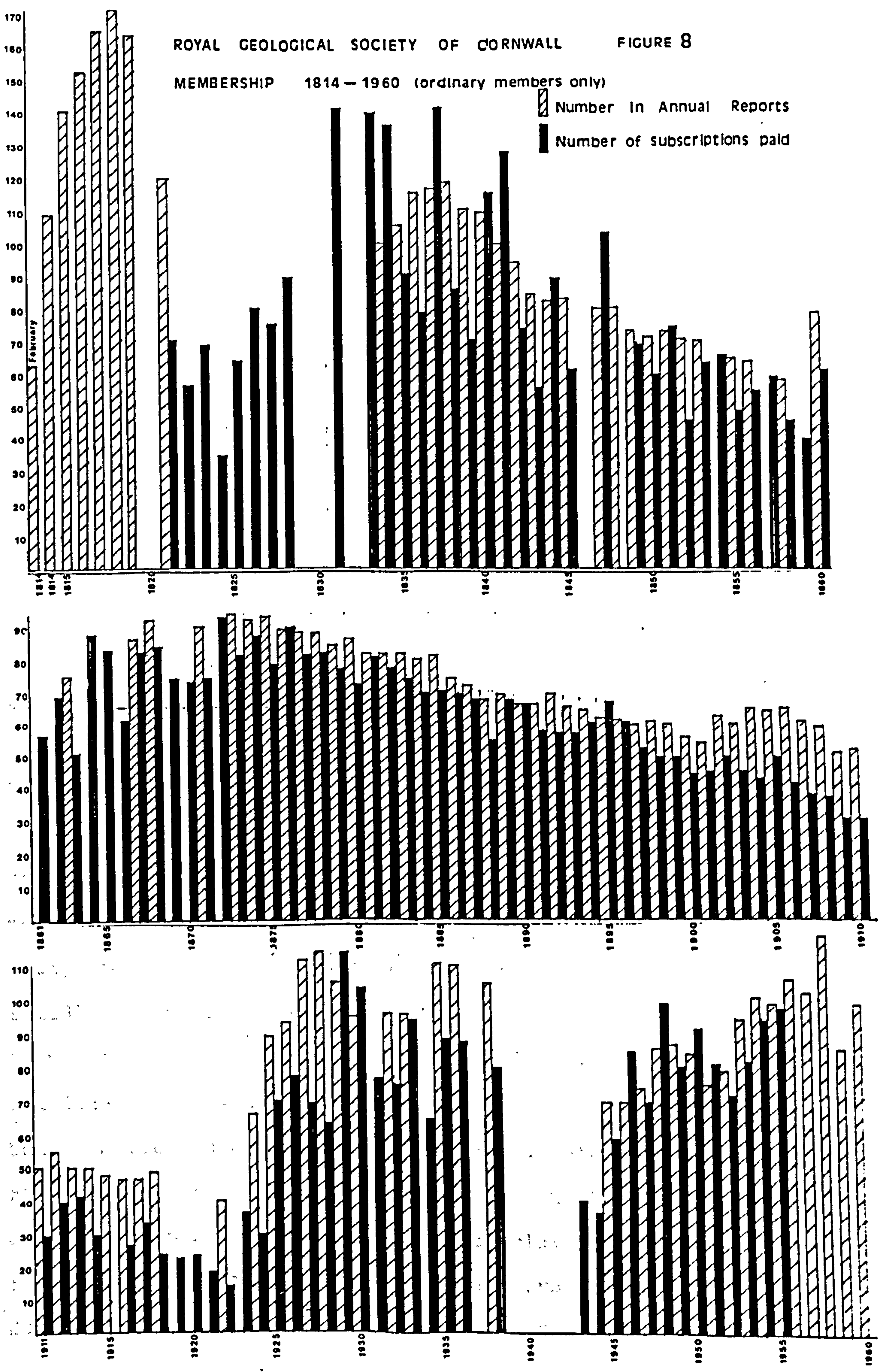
The first Minute Book of the RGSC began with three pages of names of "subscribers admitted 2.11.1814 without ballot". There were 65 names on this list (excluding the second entry for C V Le Grice, whose name appeared twice). Many of the

ROYAL GEOLOGICAL SOCIETY OF CORNWALL

FIGURE 8

MEMBERSHIP 1814 - 1960 (ordinary members only)

Number In Annual Reports
Number of subscriptions paid



entries consisted of signatures; 44 were clearly signatures, or were entries made by one person on behalf of others (eg: the entries made for Thomas, James and Humphry Pascoe were all in the same hand). Some names however gave an indication of rank (eg: SIR John St Aubyn, and John Hawkins ESQ), and were most probably made by another person.

In two cases it is most unlikely that the individuals concerned could have been at this meeting. John Hawkins, whose home was in Sussex, made no visits to Cornwall between 1804 and 1828.³³ William Rashleigh, in a letter dated the 3rd February 1814 to his steward Thomas Robins, made it clear that he was about to travel to London, as he asked that a place be reserved on the coach from Plymouth on the 14th February.³⁴ It seems unlikely that he would have made the journey to Penzance, a day's ride from his home at Menabilly near Fowey, so soon before leaving Cornwall. His name was also entered with "Esq." appended in the Minute Book.

Table 2a shows the composition of the original membership of the Geological Society in February 1814, and Table 2b the occupations of those members resident in Penzance or the immediate area. (See also Appendix 5 which lists all the founding members, and Figures 6 (p.35), and 9 (p.54.) Most founding members of the society came from the Penzance area, but a smaller number came from further afield. The majority of those who joined in February 1814, and who lived at a greater distance from Penzance, had a particular interest in science or mineralogy. Two of these were members of the Geological Society of London (John Williams jun. and George Croker Fox).

TABLE 2a

MEMBERS OF THE RGSC ON 11th FEBRUARY 1814, BY OCCUPATION

(see Appendix 5)

OCCUPATION	NUMBER	PERCENTAGE
Business men (1)	18	28
Gentry	15	23
Attorneys	9	14
Medical men	10	15
Clergymen (C of E)	5	7.7
Naval Officers	3	4.6
Mining professionals (2)	2	3
Miscellaneous	1	1.5
Unknown	2	3
	—	—
Total	65	99.8
	—	—

1. This expression includes men with extensive businesses, such as smelters and bankers, but also two with only small enterprises.

2. The two members in this category were a mine agent and a mine engineer.

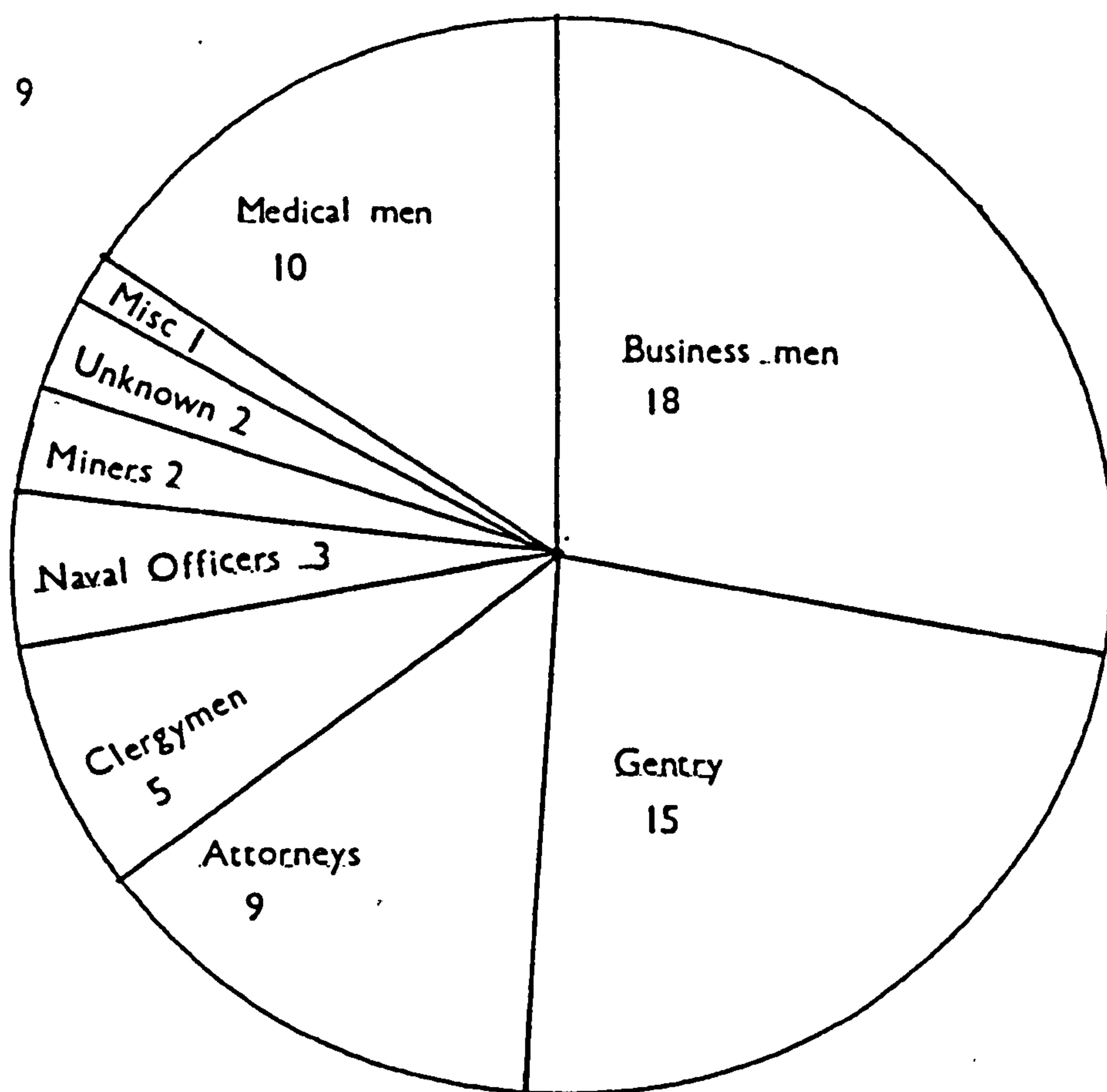
TABLE 2b

MEMBERS RESIDENT IN PENZANCE AND IMMEDIATE ENVIRONS,
BY OCCUPATION (11th February, 1814)

OCCUPATION	NUMBER	PERCENTAGE
Businessmen	13	27
Attorneys	9	19
Medical men	9	19
Gentry	7	14.6
Clergymen (C of E)	5	10
Naval Officers	1	2
Mining professionals	1	2
Miscellaneous	1	2
Unknown	2	4
	—	—
Total	48	99.6
	—	—

OCCUPATIONS OF FOUNDING MEMBERS OF THE ROYAL GEOLOGICAL SOCIETY OF CORNWALL

Figure 9



Total number of founding members: 65

R W Fox jun of Falmouth had varied scientific interests, and Richard Edwards, a Falmouth physician, had patented a method of separating arsenic from copper ore, which he employed in his own arsenic works, and in 1817 he was to become the secretary of a short-lived scientific society in Falmouth.³⁵ Some of the other members can also be described as amateur men of science. Eight were already Members of the Geological Society of London (most with Honorary Memberships, as they lived away from London), and three would join after 1814 (see Appendix 1).³⁶ All but two of these members of the Geological Society of London were, or would become, Fellows of the Royal Society, and Paris was a member of the Linnean Society.

Mineral collections were very fashionable at this period, and a number of the members had considerable collections, including William Rashleigh, Joseph Carne and John Williams. Sir John St Aubyn and John Hawkins had collections away from Cornwall. Some of these men could not however be described as having real knowledge of geology. William Rashleigh, for example, had become the custodian of an important mineral collection bequeathed to him by his uncle Philip, but he made only a few additions to it, and these have been described as "of a very inferior order".³⁷ He made no contributions to the RGSC or to the London geological society; his main scientific interest was the study of seaweeds.³⁸

It is possible to make an estimate of the number of members who had financial interests in mining or business closely associated with it. Of the gentry, at least five owned land with mineral rights from which they derived income.³⁹ Lord De

Dunstanville, the first Patron, was owner of Dolcoath, one of the richest mines in the county. Sixteen of those classified as businessmen had partnerships in either tin smelting or copper works.⁴⁰ Most copper works were in south Wales, but the reduction of copper ore was still being carried out in Cornwall on a limited scale by the Cornish Copper Company at Hayle. The manager of this company was Joseph Carne, and a number of RGSC members held partnerships in it.⁴¹

Six members were partners in Penzance banks.⁴² The links between banking and tin smelting have already been noted above in Section 2. Most of the merchants had indirect interests in mining, since they were the suppliers of coal, gunpowder and other items necessary to the mines. Attorneys, if they had responsibility for managing the affairs of a family, would also be indirectly involved in mining, and five of the six surgeons listed in Appendix 5 held posts as mine surgeons; they received an income from the "Doctor's Pence" paid by miners, and in return had responsibility for treating mine injuries etc.⁴³ Thus it can be shown that more than half the members were involved financially in mining affairs; many more may well have held shares in mining ventures.⁴⁴

A feature of many provincial philosophical and literary societies of this period was the high proportion of members who were religious dissenters. This does not seem to have been true of the Penzance Geological Society. A more detailed discussion of this topic will be found in Section 3.4 below.

3.3 Memberships of societies: comparisons

3.3.1 The landed gentry

The original membership of the RGSC included most of the gentry from the immediate environs of Penzance (see Section 3.2 above and Tables 2a and 2b). By 1818, the number of landed gentlemen had risen to 42, 26% of the total membership (see Table 3). There seems to have been a deliberate policy of encouraging such members, as when for example, the Earls of Mount Edgcumbe and St Germans were admitted as Ordinary Members without the usual procedure of a ballot.⁴⁵ This may have been done partly in expectation of generous financial contributions to the society's funds (see below). Most of the gentry were not active participants in the work of the society. Ashhurst Majendie, the Hawkins brothers (Sir Christopher and John), Davies Gilbert and Sir Rose Price were exceptions, as was, at a later date, Sir Charles Lemon. The contributions of some of these men will be discussed in later sections.

In 1818, at the time of the foundation of the Royal Institution of Cornwall, 9% of its membership were from the gentry, and this proportion did not change substantially during the first 22 years of the society's existence; the majority of members were in any case residents of Truro, or lived close by.⁴⁶ Lord De Dunstanville and Lord Falmouth only accepted Vice-Presidencies in 1829, after "declining several invitations".⁴⁷ De Dunstanville had been the first Patron of the

TABLE 3

ORDINARY MEMBERS OF THE RGSC, BY OCCUPATION, 1818
From Transactions, Royal Geological Soc, Cornwall, I, 1818

OCCUPATION	NUMBER	PERCENTAGE
Business men	40	25
Gentry	42	26
Attorneys	13	8
Medical men	17	11
Clergymen (C of E)	17	11
Naval Officers	1	<1
Mining professionals	6	4
Miscellaneous	3	2
Unknown	20	12
	159	100

Honorary members: 28

Associate members: 8

RGSC (and remained as Vice-Patron, after he was replaced by the Prince Regent); Lord Falmouth had joined the RGSC in 1815. The Polytechnic Society was more like the RGSC, for more than 20% of its members came from the landed gentry. The founders of the RCPS deliberately tried to involve influential men of the county in its various activities, in order to promote its ideas of self help and improvement.⁴⁸

The only other provincial societies with proportions of gentry to match those of the RGSC were the Manchester Lit and Phil (17% in 1809-11) and the Natural History Society of Northumberland (more than 24% in 1829).⁴⁹ In Northumberland, lead and coal mines were an important source of income to the owners of land, so they may have had good reason to be interested in the activities of the Natural History Society.⁵⁰ Membership of the Liverpool Lit and Phil was mainly middle-class, as was that of the Pottery Philosophical Society.⁵¹ The original members of the Yorkshire Geological Society were coal mine owners and manufacturers. Only after 1840 did the Yorkshire Geological Society try to attract the landed interest by introducing discussion of agricultural geology and chemistry.⁵² Many of the members of the Geological Society of London were "establishment" figures; the Honorary Membership, recruited from interested persons living outside London, included some of the provincial landed gentry, several of them from Cornwall. Most of these members did profess an interest in geology, as they were encouraged to join for the sake of the contributions they could make to the geological map of Britain, one of the objects of the society in its early years.⁵³

Some members of the gentry were recruited to scientific societies in order to confer status and to contribute to a society's funds. By 1820 the RGSC had received over five hundred pounds in donations from Cornish gentry. These included one hundred guineas from the Prince Regent as Duke of Cornwall, ninety pounds from Lord De Dunstanville, sixty pounds from Lord Falmouth and 30 guineas from Sir John St Aubyn.⁵⁴ Other gentlemen were amateur men of science, and could make major contributions to the work of a society. In the RGSC John Hawkins was a notable example, contributing a total of twenty papers to the society between 1817 and 1832.⁵⁵

Some of the gentry would have joined for the sake of the fashionable activities which became part of the society's programme. The Anniversary Meeting of the RGSC became an important function in the social calendar of Cornwall in the 1820's. In some years, leading geologists from the London society visited Penzance, including Sedgwick, De la Beche and Buckland, and they proved to be popular attractions at the Anniversary Meetings.⁵⁶ The Annual Dinner, held after the meeting in one of the local hotels, was a part of the event. Sir Rose Price of Trengwainton, just outside Penzance, frequently acted as host to some of the gentry who lived at a distance. Davies Gilbert recorded in his Almanac for 12th October 1827:⁵⁷

12th. The Geological Society, the 14th. I again elected President. My sister, Davies [his son], and myself fetched with Sir Christopher Hawkins by Sir Rose Price's carriage to Trengwainton - slept there.

John Hawkins, on one of his rare visits to Cornwall in 1830,

wrote to his wife describing the Anniversary Meeting:⁵⁸

I accepted a written invitation from Sir Rose Price to visit him at Trengwainton. On Wed'Y morning we proceeded in three carriages to attend the geological meeting in Penzance. It was one of the fullest ever known... From the Society's apartments, we adjourned to the hotel and had some more speeches after dinner... I was glad to escape from all this bustle to Trengwainton. Here I found D Gilbert, Dr Paris, the Sheriff and another gentleman and six young ladies the daughters of Sir Rose, a very handsome family.

An interest in the profitability of mining may also have been an initial reason for the recruitment of large numbers of gentry to the RGSC, for most of them had financial involvements in the mines of the county, and might have expected the society to contribute to the prosperity of that industry.

Few of the gentry who joined the society came from the old established land owners of the county, and those who did join, such as Sir John St Aubyn and Lord Falmouth, did not actively participate in its affairs.⁵⁹ Cornwall did not have many representatives from this class by the 19th century, for families such as the Godolphins had died out. Many of the 19th century gentry of Cornwall were new to these ranks, having made their fortunes and acquired land through successful businesses (see also Section 4 below).

3.3.2 The professional classes

The scientific training received by physicians would have made them obvious candidates for office in learned societies. Medical men were important to the RGSC and to other similar societies. For the first 25 years of its existence there

were close links between the RGSC and the Penzance Dispensary. A number of secretaries of the society were also physicians to the Dispensary: these were Paris, Dr John Forbes, Dr H S Boase (son of Henry Boase, the banker), and Dr T F Barham, who also served as Librarian to the society. Other Officers of the Dispensary, the surgeons and apothecaries, were also members of the RGSC. Edward Collins Giddy, one of the surgeons, served as Assistant Secretary from 1815-17, and as curator from 1818-33, holding the latter post jointly with the secretaryship from 1828-33. (A list of the Presidents and Officers of the RGSC, from 1814, can be found in Appendix 7.)

Medical men could also be found among the members of the other Cornish societies, but few held important offices. Two exceptions were Richard Edwards, founder of the short-lived Falmouth Physical Institute (see above), and Dr Richard Taunton, physician to the Truro hospital, who gave some lectures at the RIC in 1819-20 on experimental philosophy.⁶⁰ Medical men were also important in the Bath, and Pottery Philosophical Societies and the Manchester, Newcastle, and Liverpool Lit and Phils.⁶¹

Other professional men, particularly attorneys, were well represented in the RGSC, but they were not active participants. As educated men, they would in any event have welcomed the opportunity of belonging to a learned society, but in Cornwall, because of their involvement in legal cases concerning mining affairs and in the management of estates, they may have had more cogent reasons for becoming members of

a society which publicised its interest in that industry. The fact that the legal profession does not seem to figure strongly in the memberships of other comparable societies lends some weight to this case.

3.3.3 Business interests

As shown in Section 3.2, the membership of the RGSC included a large component from the business community, especially bankers and tin smelters. Although the proportion of members from the business community fell between 1814 and 1818, there was still an important section from this group who sought membership, and attended meetings of the society (see Table 3 (p.58)). The reasons for their possible involvement have already been discussed above. Most were passive, attending meetings but not submitting papers.

There was one group notable by its almost complete absence from the activities of the RGSC: those directly employed in mining. Although the miners themselves would not have been welcome as ordinary members, it might have been expected that captains, agents, pursers, etc would have been interested in the meetings, but few joined. Two of those included in the figures for mining professionals in Table 3 were Richard Trevithick and Arthur Woolf, both mine engineers. The former joined only just before he departed for Peru, so cannot be counted as active, and there is no record of any contribution from Woolf.⁶² Samuel Moyle was the engineer of the Chacewater mine; he was never actively involved with the RGSC, and he apparently ceased his membership after 1819.⁶³ Two others who

did make contributions to the RGSC meetings were John Rule, the surveyor of Dolcoath, one of the biggest and richest mines in Cornwall, and William Chenhalls, a mine agent from St Just (their contributions will be discussed in later sections). This scarcity of members from the mining community will be raised again below. Some men with mining connections did however become associate members of the society.

Many businessmen also joined the Polytechnic Society; not only the Fox family, but the Williams and the Daubuz's.⁶⁴ Richard Taylor, the son of John Taylor (mining entrepreneur and Treasurer of the Geological Society of London), was the first secretary of the RCPS. He was responsible for the day-to-day management of the Taylor family interests in the Consolidated Mines in Cornwall.⁶⁵ Pearson suggests that Richard Taylor was invited to be secretary in an attempt to gain the support of his family.⁶⁶

The Manchester Lit and Phil had a membership which included many merchants and manufacturers (56%) by 1809-11. A similar proportion of that class joined the Pottery Philosophical Society, and mine owners were strongly represented in the Yorkshire Geological Society.⁶⁷ The Natural History Society of Northumberland had a special class of subscriptions for "Owners of Collieries"; they paid five or ten guineas annually, and in 1830 there was a total of 12 in this group.⁶⁸

3.3.4 Associate members

Few of the societies mentioned above had special categories

for associate members. The RGSC included this section from the start; in the first edition of its Rules, under the heading of Associate Members, there followed: "...intelligent miners, who have deserved the thanks of the society for their presents of minerals, or for the practical information which they have communicated: they shall enjoy every privilege of the ordinary members, without any expense". The RIC had a very similar category: the 'Rules' (1818) stated that "respectable captains of mines, and other scientific persons, are eligible as Associates".⁶⁹ Although there appear to be differences between the definitions of associate members of the two societies, it is unlikely that the RGSC would have included anyone of lower status than a mines captain in this category. Neither of these two Cornish societies had very many associate members: the RGSC had three only by 1815, and 8 in 1818; the RIC had 13 associate members in 1829.⁷⁰ The first associate member of the RGSC joined in July 1814; the second, John Stephens of St Agnes, was elected in November 1814 as a reward for some answers to a printed series of questions "relative to the situation and direction of Lodes", which had been circulated by the society.⁷¹

It is probable that such members were encouraged more for what the RGSC could get from them, rather than for what it could do for them. On several occasions the society exhorted miners to provide specimens and information for the society, and members were apparently puzzled by the lack of response. Some at least of the practical men were however doubtful about the claims of the RGSC to assist the industry. A correspondent in

the West Briton in August 1814, who signed himself only "A Cornish Miner", wrote:⁷²

....Each of the learned professions speaks in technical terms which are almost totally unintelligible to the generality of mankind, upon whom definitions so conveyed would be wholly thrown away. Hence, if the Society would benefit the public at large by its labours, it will be necessary that it obtain the assistance of persons of PRACTICAL experience in the subjects it means to discuss. It may elucidate my meaning to ask one of the learned Members of the Penzance Graphical [sic] Society what he supposes a Mineralogist from the Metropolis would understand a Cornish miner meant, who should inform him that his load [sic] was heaved by a flookan, or that it was destroyed by a cross-gossen.

Even if the quality of much of this letter makes it doubtful that it was written by any ordinary miner, it must be allowed that there was some truth in what the author had to say.

In 1815 at the Anniversary meeting, after one of the members, William Chenhalls, had been voted a medal for his efforts in developing some safety mining instruments (see Section 7 below), it was resolved that:⁷³

...a medal with an appropriate devise [sic] be immediately struck and presented to those Miners who had contributed practical information to the Society or who had by their exertions promoted its views.

As no 'Treasurer's Reports' were published before 1820, it is not possible to find out whether a medal was struck; there were no references to the presentation in the minutes or reports, and it is possible that the idea was later rejected.⁷⁴ There were other examples, in the minute book for this period, of a resolution being made and subsequently crossed out of the record.⁷⁵

In October 1823, a proposal was made to establish "Mineralogical Premiums", which would be used to encourage miners to discover new minerals and present them to the society.⁷⁶

Details of the scheme were worked out and described at the next Quarterly Meeting in November 1823. The regulations for the awards were to be printed and circulated among the miners, and the premiums were to be presented at Annual Meetings; the total amount was not to exceed ten guineas a year.⁷⁷ Whether anything further was done is not clear; there were no records of presentations, and the 'Treasurer's Reports' did not include relevant entries.

There are two possible reasons why such schemes to involve miners in information gathering were apparently abandoned. It may have been that there were too few members with sufficient enthusiasm to put the schemes into operation, or alternatively a shortage of money may have been used as a pretext to defer implementation; there is however a scarcity of detail which can be used to decide whether either of these reasons approaches the truth.⁷⁸

In 1830, Paris visited Penzance, and attended the Anniversary Meeting of the RGSC. During the course of the meeting, he announced that he proposed to donate £10 for a medal, to be awarded to the writer of the "best practical communication on mining".⁷⁹ It is possible that he had intended this medal to go to a practical man, but not all the members seem to have agreed with his ideas. Whether they did not wish a medal to be awarded to a miner is not clear, but Joseph Carne wrote to John Hawkins in October 1830:⁸⁰

I perceive (what I did not know at first) that Dr Paris has limited his proposed medal to the best practical communication on Mining. I question the propriety of this, as it is very possible that what appears at first sight strict-

ly Geological, and applicable principally to the surface, may have eventually an important practical result. Would it not have been better if he had left the decision entirely to the Umpires, only directing that the medal should be allotted to 'the Communication which in their opinion is likely to be most useful to Cornwall'? Should my remarks meet your views, you may perhaps have an opportunity of mentioning the subject to Mr Gilbert, or to Dr Paris.

There is no record of the award of any medal bearing Paris's name; whether this was because no suitable contribution was made, or whether Paris withdrew the award, is not known.

In 1841, Sir Charles Lemon, the new President of the RGSC, proposed that the society should award premiums for specimens or information contributed by a member of the mining community.⁸¹ The total amount to be shared out was only £5, and there was no response. When it is considered that mineral dealers, in Cornwall or from London, were prepared to pay large sums for prime specimens, it is perhaps not surprising that the offer from the society met with no success.⁸² Sir Charles however attributed the failure to "the reluctance of the miners to put pen to paper".⁸³

The RCPS did not have a special category for associates, but instead kept its annual subscription very low, at only 5/- (the annual subscription of the RGSC was one guinea). This policy was intentional, in order to encourage those members who could afford only the small amount, although those who could pay more were expected to make larger contributions.⁸⁴

The Plymouth Institution had associate members, but these were men who chose not give lectures; they paid 2 guineas a year, whereas the ordinary members who agreed to lecture paid only

one and a half guineas.⁸⁵ The high subscription must have deterred many from joining, yet in 1816, there was trouble, caused by the rejection of the application by Mr George Harvey, "an Artisan", to become a member. This led to a resolution by the secretary, Henry Woollcombe, that:⁸⁶

...as this society is supposed to have declared...that no man in a humble situation of life shall be admitted as one of its members, it takes this opportunity of declaring most unequivocally that, in the selection of its Members, it will always be less influenced by the accidental circumstances of birth and fortune, than by the more solid qualities of intellectual attainments and moral worth.

The problem was unresolved, and the society was dissolved, to be reformed again in February 1817, on lines that "tried to avoid offending either side in the dispute".⁸⁷

In Manchester, the Geological Society had initially intended to admit miners as associates at no cost, but this proposal was opposed by Francis Looney, who was described as "an artisan with broad scientific interests". He believed that "if miners were sufficiently remunerated for their work they would have sufficient means to pay the annual subscription"; the proposition appears to have failed because of his objections.⁸⁸

3.3.5 Honorary Members

Most societies had honorary members, but the qualifications for such members varied. In some cases, they were chosen to confer honour on an individual, and to acquire status for the society. Many of the honorary members of the RGSC fell into this category, as over the years the society elected most of the leading names in geology. Seven were chosen at the ini-

tial meeting in 1814, including Sir Joseph Banks, and Sir Humphry Davy.⁸⁹ By 1818, there were 28 honorary members, and by 1840, 38. More details about honorary members, and particularly those with geological knowledge, will be found in Section 8.

Sir Humphry Davy was an obvious choice for an Honorary Member, for Penzance had been his home town. Whether Davy deserved the attentions paid to him by the society is doubtful. He did respond to his appointment by donating £20 and by promising specimens of minerals from Italy, but there were long delays before the samples arrived, and there is some question whether he did supply them himself. He wrote to Henry Boase in July 1816:⁹⁰

I believe my assistance to the Geological Society of Penzance this year must be limited to good wishes as far as communications are concerned. I will however send for a copy of my last publication on the safe lamp. The specimens that I intended for Penzance from Vesuvius are not yet arrived: but perhaps I may find something out of the rich collection that Cap't Pentreath brought me and which are illustrations [of] particular geological facts, for the Penzance Collection.

Davy was never recorded as visiting the society's museum or attending any meetings when he made one of his rare appearances in Penzance. Davies Gilbert, in his Almanac for 1815, noted that Davy was in Penzance from at least the 23rd to the 29th November. Gilbert and his wife called on him on the 29th, and were entertained "with various particulars of foreign countries, as to their Geology, Politics, &c".⁹¹ Gilbert also recorded that he presided at a meeting of the geological society held on the 1st December of that same year, but did not suggest that Davy was present.⁹² Davy was again in Pen-

zance in December 1821 at the invitation of the Borough Council, and again the society seems to have been virtually ignored.⁹³

The RIC had far fewer honorary members (8 in 1824), while the RCPS rarely had more than four at a time, and these were elected annually. In both cases, the reasons for the appointments seem to have been to confer an honour, and to acquire status and publicity for the society.

The honorary members of some societies were those who wished to participate, but lived away from the immediate area; in other societies, they might have been called Corresponding Members. This was true of the Manchester and Newcastle Lit and Phils, and the Geological Society of London. An additional qualification for honorary membership of the London society was that the member should be able to contribute to the work of the society; this was most important in the early years of the society.⁹⁴ The RGSC conditions for honorary members also included the provision that the member must live outside of Cornwall.⁹⁵

3.4 Religious affiliations of members of societies

Only a small proportion of the membership of the RGSC belonged to one of the dissenting groups, and none of the clergy among the members was from this group. The only two important dissenting sects in Cornwall in the 19th century were the Methodists and the Society of Friends. Only four of the foun-

ding members have been identified as Methodists; by far the most important of these was Joseph Carne, for many years the society's treasurer, and a major contributor to its Transactions.⁹⁶ There were also a few Quakers, including the Fox family from Falmouth; R W Fox made important contributions to the RGSC Transactions, but in 1833 the family's major concern became the new society based in Falmouth.⁹⁷

The members of the Fox family were participants in all the activities of the RCPS, determining its policy, assisting in its running, exhibiting at annual shows, and contributing papers to the Annual Reports. In the early years they preferred not to serve as officers, although several members of the family were on the Committee.⁹⁸ One of the early secretaries, Lovell Squire, who held the post from 1835 to 1839, was a Quaker minister.⁹⁹ Despite the society's Quaker origins, the greater proportion of those who supported it came from the established church; gentry and Anglican clergymen were particularly prominent. The RIC was similar to the RGSC in that individuals from dissenting sects did not feature strongly among the membership. One important exception was William Mansell Tweedy, a Truro banker, and a convert to the Society of Friends, who held the post of Secretary to the RIC from its foundation in 1818 until his death in 1856.¹⁰⁰

The Cookworthy family were Plymouth Quakers who had been responsible for the initial development of the Cornish china clay deposits in the previous century. A "Dr Cookworthy" had presided at the meeting when the Plymouth Institution was

founded in 1813.¹⁰¹ John Prideaux, also a Quaker, and a chemist and druggist, was one of the more active members, until his death in 1859.¹⁰² There was however no domination by dissenting groups, and the secretary, Henry Woollcombe, was Anglican.¹⁰³ There were also members of minority religious groups among the early membership of the Geological Society of London, but none was of major importance. There was a number of Quakers, including William Phillips, also a member of the RGSC, and John Taylor, for many years the Treasurer (1816-44), was a Unitarian.¹⁰⁴ Provincial societies in which dissenting influences were strong were often those formed in parts of the country with large congregations of dissenters. For example, the Manchester Literary and Philosophical Society had important Unitarian and Quaker elements in its membership in its early years.¹⁰⁵ The Liverpool Lit and Phil and the Pottery Philosophical Society also had important dissenting memberships.¹⁰⁶

A number of papers on the origins and early years of some provincial learned societies include discussion of the concept of "marginal men"; the idea that members of dissenting sects needed to find alternative outlets to compensate for their exclusion from public office.¹⁰⁷ This concept does not seem to apply to the RGSC. Cornwall was little influenced by the 16th and 17th century movements which led to the formation of dissenting groups in many other parts of the county. It could be said that religion did not touch the everyday lives of the great majority of the people of Cornwall, for the Church of England seemed unconcerned about them; many parish priests held plural benefices, and their parishes had to make do with

underpaid curates.¹⁰⁸ The advent of Methodism brought about changes, but this was a movement which affected primarily the working classes. Two classes "conspicuous by their absence" in the Methodist movement were the landed gentry and the professional classes; the trustees of Penzance Wesleyan Chapel in 1812, for example, were three shopkeepers, two merchants, a joiner, a turner, a tallow chandler and a schoolmaster.¹⁰⁹ In 1839, in a report to the Statistical Society of London by Richard Edmonds, there was included a Table of 'Places of Public Worship' in Penzance, which listed the number of members for each of the various religious groups (see Appendix 8).¹¹⁰ This showed that the different Methodist groups were still the dominant dissenting sect.

The few men in the RGSC who did join the Methodist movement, such as Joseph Carne, were careful to keep their links with the Anglican church, for example by maintaining family pews in the new St Mary's Church.¹¹¹ It cannot be appropriate to use the expression "marginal man" to describe such an individual. The Quaker Foxes from Falmouth were successful and respected business men who included among their friends most of the gentry in Cornwall; they also entertained many of the leading personalities in science at Falmouth, or visited them in their homes elsewhere.¹¹² The concept of marginality is not relevant to their activities either. Many of the members of the RGSC who had influence on the society's affairs came from the landed gentry and the professional classes, those who tended to avoid the Methodist movement. The Williams family of Scorrier, which included a Methodist, a Quaker and an Anglican

among its members, will be discussed in Section 4.

.....

The active members of the RGSC, those who contributed papers or held office as secretary, treasurer, librarian or curator, were almost always from the professional middle classes. Members of the medical professions, for example Paris and Forbes, and some men from business occupations, such as Carne and Henry Boase, were especially prominent. The Council of the society was never very important; its composition and function will be discussed in the Conclusion, where it will be argued that election to it was sometimes an alternative to Honorary Membership. No records of attendances at meetings have survived, but it is possible to gain some idea of the people present from newspaper reports of meetings, and from the names of the Chairmen of meetings and proposers of motions, recorded in the Minute Book of the society. The Anniversary Meetings of the society usually attracted a number of the county gentry, but many of these were the newly rich, rather than the old established families of the county. Lord De Dunstanville, a Vice-Patron, and Davies Gilbert, the President, can most accurately be described as acquiescent spectators of the proceedings. The regular members at other meetings seem to have come mainly from the middle classes, and as might be expected especially those from the town of Penzance. It must therefore be concluded that the RGSC was a predominantly middle class institution, but one which sought additional status through the inclusion of the names of non-participating members of the gentry on its books.

NOTES AND REFERENCES

1. Freeborn (1986), (66).
2. Rules of the Cornwall Literary and Philosophical Institution, 1818.
3. Cornwall County Library Committee Minute Book No.1 1792-1841, gives details of members attending meetings. For the move to the RIC building, see Minutes of meetings on 25th Sept 1832, and 7th Feb 1833. (Pages are not numbered.) CRO X15/1.
4. Rules of the Cornwall Literary and Philosophical Institution, 1818.
5. Freeborn (1986), (61).
6. The RIC included a class of Proprietors, who bought "shares" for 10 guineas. Most of them became Annual Subscribers in addition, for with a payment of 1 guinea, they could obtain access to the facilities of the institution for all the members of their families.
7. Annual Report of the Royal Institution of Cornwall, 1837 (16-9).
8. British Library Add. Mss. 29 281 ff.138.
9. 12th March 1818, Rogers Family Autograph Collection, 1, CRO RP 16/11.
10. British Library Add. Mss. 29 281 f.140. The Falmouth institute referred to in the letter was the Physical Institute, run by Dr Richard Edwards. (See also Footnote 35.)
11. Pearson (1973), (22).
12. Letter dated 12th January 1820, British Library Add. Mss. 29 281 ff.165-6.
13. Minutes of Provisional Committee Meeting, 20th December 1833. RCPS 1st Minute Book.
14. Pearson (1973), (26).
15. Minutes of Provisional Committee Meeting of the Cornwall Polytechnic Society, 20th December 1833.
16. RCPS Annual Report 1835 (16).
17. RCPS 6th Annual Report 1838 (9).
18. The Committee Members were listed in the Annual Report for 1833, in RCPS Annual Reports, I, (14-6).
19. Ibid (9-10). The RCPS list of names is compared with the membership list for 1834 in the RGSC Annual Report 1834 (the nearest year available for comparison).

20. Minutes of a General Meeting of the Members of Cornwall Polytechnic Society, 11th March 1835.

21. Another institution had been founded in Penzance in 1829 (or 1830), the Penzance Literary and Scientific Institution. It gave weekly lectures on a wide variety of topics, but to the artisans and craftsmen ignored by the RGSC. Pearson (1976), (15).

22. An advertisement about the alteration in the date of the exhibition appeared in the Penzance Gazette for 3rd March 1841. Visitors from the BAAS meeting at the RCPS exhibition were listed in the West Briton 6.8.1841. The RGSC Anniversary Meeting was held on 24th September 1841.

23. 9th January, 1841, RCPS Minute Book No.3 (60).

24. R Hocking and R Edmonds; February 1841, RCPS Minute Book No.3 (67).

25. RIC 24th Annual Report 1842 (29).

26. Committee Meeting June 6th 1842, RCPS Minute Book No.3 (100).

27. Laws 1827, included in Transactions of the Plymouth Institution, I, 1855-65 (5).

28. 'Historical Sketch of the Origin and Progress of the Plymouth Institution; being the Substance of the late President, Mr J N Bennett's Inaugural Address', Annual Report of the Plymouth Institution, 1858-9, (15).

29. Transactions of the Plymouth Institution 1830, (356, 358).

30. Ibid., Appendix (353).

31. Pearson (1973), (415).

32. RIC, Annual Report 1839, (15).

33. Steer (1966), Letter No.78, (73).

34. Letter dated 3rd February 1814, Rashleigh Estate Papers, 1814, CRO R 5307/34.

35. For Richard Edward's patent see the Royal Cornwall Gazette 12th June 1813. For the arsenic works, Barton (1970) (103). Advertisement for Cornwall Physical Institute in West Briton 26th December 1817. (An alternative title sometimes used was Falmouth Physical Institute).

36. Details of the early membership are given in the Appendix to H B Woodward (1907), (268-85). They were: Davies Gilbert, Wm Rashleigh, Sir John St Aubyn, John Hawkins, Joseph Carne, John Williams jun, G C Fox and Charles Lemon, and after 1814, Ashhurst Majendie, E W Stackhouse, R W Fox jun.

37. Arthur Russell (1946), (103).

38. DNB.

39. Evidence for ownership of mineral rights can be found in a variety of sources, including correspondence. The five identified were: Sir Christopher Hawkins, Sir John St Aubyn, E W W Stackhouse, Sir Rose Price and William Rashleigh.

40. Evidence for partnerships comes from reports in the local newspapers, etc. Those identified were: John Batten, H C Blewett, Wm and Thos Bolitho, Wm and Joseph Carne, Wm Cornish, Richard Oxnam, James Pascoe, Richard Pearce, Williams family of Scorrier and the Fox family of Falmouth.

41. The Williams and Fox family interests were in Wales. For the Cornish Copper Co. see Pascoe (1981). The partners in CCC in 1814 were: Sir Christopher Hawkins, George John and Wm and Joseph Carne.

42. Appendix, Collectanea Cornubiensia. The partners were Henry Boase, Wm and Thos Bolitho, John Batten, Wm Carne and Richard Oxnam.

43. Hamilton Jenkin (1962), (141-2). Two mine surgeons, both members of RGSC, are named in Transactions, Royal Geological Soc., Cornwall, I, (91).

44. It would be possible to establish which members held shares in mining concerns, by examination of the surviving records of mining companies. This task would however entail lengthy work, as the number of companies was very great, and the majority were cost book companies, not joint-stock companies.

45. Minutes of Anniversary Meeting 16th September 1817, RGSC Minute Book No.1.

46. 'List of subscribers 1818-1835', in RIC Annual Report 1837, (16-20).

47. Freeborn (1986), (80).

48. See RCPS Annual Reports 1833, etc for lists of annual subscribers. For "self-help", see Pearson (1973), (38).

49. For the Manchester Lit and Phil, see Thackray (1974), (695). For Natural History Society of Northumberland, see Report of the Natural History Society of Northumberland, Durham and Newcastle-upon-Tyne, 1830, (15).

50. Hughes (1963).

51. For Liverpool Lit and Phil, see Kitteringham (1982), (335). Also Shapin (1972), (320).

52. Morrell (1983), (243).

53. Rudwick (1963), (330).

54. 'Treasurer's Report', RGSC Annual Report, 1820.
55. Most of Hawkins's papers were printed in Transactions, Royal Geological Soc., Cornwall, I-IV, 1818-32.
56. Sedgwick attended the Anniversary Meeting in 1819; West Briton 1st October 1819. De la Beche and Buckland were present in 1836; West Briton 9th September 1836.
57. Davies Gilbert Almanac for 1827 CRO DG 22.
58. WSRO (H), 8, No.1984.
59. There is no evidence that St Aubyn ever attended the Society's meetings, although he had contributed to its funds.
60. Freeborn (1986), (97).
61. For the Bath society see Torrens (1979). For Newcastle, see Middlebrook (1974). For Liverpool, Kitteringham (1982), (335).
62. Richard Trevithick was recorded as being elected a member in September 1816; an account of his departure for and activities in Peru was given in Henry Boase (1818). Arthur Woolf was made a member in December 1818, RGSC Minute Book No.1.
63. Moyle's name was not included in the lists of members published after 1818, although his death did not take place until 1867.
64. The Williams family were partners in the copper smelting business of Williams, Foster and Co., and in many other enterprises. The Daubuz family had smelting works in Truro and Penzance (see Table 1).
65. 'Rules &c.', at the front of the First Minute Book of the RCPS. See also Burt (1977).
66. Pearson (1973), (42).
67. For the Manchester Lit and Phil, see Thackray (1974), (682). For the Potteries society, see Shapin (1972), (315), and for Yorkshire society, Morrell (1983), (240-1).
68. Natural History Society of Northumberland, Report for the year ending August 3 1830, 1830, (4).
69. Rules of the Cornwall Literary and Philosophical Institute, 1818, (6-7).
70. See 'List of Members' in Objects and laws of the Royal Institution of Cornwall, 1829, (21).
71. Quarterly Meeting May 1814, and Quarterly Meeting November 1814, in RGSC Minute Book No.1.
72. West Briton 5th August 1814.

73. Anniversary Meeting 10th October 1815, RGSC Minute Book No.1.
74. RGSC Annual Report 1820.
75. In February 1815 a proposal to create a new class of Corresponding Members was made, and this was reported in the West Briton for 10th March 1815. The minutes for the 15th February 1815, in the RGSC Minute Book No.1, contained a long passage, heavily scored out, which possibly referred to Corresponding Members.
76. Anniversary Meeting 15th October 1823, RGSC Minute Book No.1.
77. Quarterly Meeting 10th November 1823, RGSC Minute Book No.1.
78. In each of the years 1820-25, the accounts showed a small surplus, sufficient to fund a medal or premium. 'Treasurer's Reports', RGSC Annual Reports 1820-25.
79. RGSC Annual Report 1830.
80. WSRO (H), 2, Pt.7/907.
81. 'President's Address', RGSC Annual Report 1841.
82. Some letters between Philip Rashleigh, and his mineral dealer, Henry Heuland, give an idea of the sort of prices which could be paid for good mineral specimens. Correspondence concerning minerals, etc 1800-1846, Rashleigh Estate papers, CRO, R/5757/2/61-90.
83. The quotation is from the 'President's Address', RGSC Annual Report 1847.
84. Pearson (1973), (43).
85. 'Laws', 1827, in Transactions of the Plymouth Institution, I, 1855-65, (9-10).
86. The details of this episode were told in the Plymouth Institution, Annual Report, 1858-9, (16).
87. Ibid. (16).
88. Kargon (1977), (25).
89. Initial meeting 11th February 1814, in RGSC Minute Book No.1. The report in the West Briton newspaper for 25th February 1814, about this meeting, listed five of the seven, but included five others who were not chosen, including Werner and "Dr Clarke of Cambridge".
90. The minutes of the Quarterly Meeting, 17th February recorded the donation of money, and Davy's intention to send a box of minerals; RGSC Minute Book No.1. The letter to Boase is in

British Library Add. Mss. 29 281 ff.83/4. The arrival of the minerals was reported in the Annual Report for 1823.

91. Davies Gilbert Almanac 1815 CRO DG 19.

92. Ibid.

93. West Briton 11th January 1822.

94. Rudwick (1963), (329-30).

95. Rules of the Cornwall Geological Society 1814.

96. Joseph Carne presented over fifty papers, and reports on the statistics of mining, between 1814 and his death in 1856. Other Methodist members identified were William Carne (father of Joseph), John Williams sen. and William Chenhalls.

97. R W Fox gave ten papers in the years 1819-37. RGSC Annual Reports 1814-56. Other Quaker members identified were John Williams jun. and Robert Dunkin.

98. Entry for W M Tweedy in Bibliotheca Cornubiensis stated that he joined the Society of Friends in 1814.

99. Annual Reports of the RCPS.

100. RCPS Minute Book for January 1839, (184), and Annual Report 1835.

101. The reference to "Dr Cookworthy" is found in Plymouth Institution Annual Report 1858-9, (15). For William Cookworthy and the discovery of China Clay, see Raistrick (1968), (202-210).

102. An obituary of John Prideaux appeared in Plymouth Institution Annual Report for 1859-6.

103. See entry for Woollicombe in Bibliotheca Cornubiensis.

104. Woodward (1907), (45-6).

105. Thackray (1974), (679, 681).

106. For the Liverpool Lit and Phil see Kitteringham (1982), (335), and for Pottery Philosophical Society, Shapin (1972), (318-9).

107. "Marginal men": see Thackray (1974), (678), and Inkster (1977), (1-32).

108. Gay (1971), (160-1).

109. Probert (1971), (22-4).

110. Edmonds (1839), (36-7).

111. Joseph Carne donated 50 guineas to the new church; see list of subscribers in Manuscript Book of Thomas Giddy CRO EN

2435 (pages not numbered). For pew rentals, see West Briton 21st April 1826.

112. Accounts of visits and visitors of the Foxes can be found in: Pym (ed) (1883), and in Brett (ed) (1979).

4 THE AIMS AND OBJECTIVES OF THE RGSC

In this section it is intended to discuss the early objectives of the RGSC, and to make some comparisons with those of other similar societies. Several of the openly declared aims of the RGSC were proposed at the initial meeting held on 11th February 1814, in speeches made by John Ayrton Paris, C V Le Grice and Davies Gilbert, but there were other, hidden reasons for the enthusiasm with which the new society was greeted. As the years passed, the society developed some of its aims further, and others were added. The most immediate aim of the RGSC, as a scientific society, was the advancement of the science of geology. The detailed geological aims of the society will however be discussed in Section 8. Most Lit and Phils had wider agendas than the more specialised societies. Except where relevant, the literary and cultural objectives of these institutions will be omitted, and only those relating to science will be discussed.

4.1 The advancement of science

Why should the new learned societies of the latter part of the eighteenth and early years of the nineteenth century have wanted to promote science, even if for some it was only a part of their proposed activities? One reason would have been because it was seen as a polite recreation. The members could indulge in a fashionable activity, by enjoying lectures and demonstrations, without the need to participate actively or to study in depth. There was also genuine curiosity about science, as few had had the opportunity to learn more than

they were able to gain from their own reading. A report of the RGSC Anniversary Meeting in 1819, typical of many, shows how the meetings became fashionable events at which the local people could enjoy observing the elite of the geological world:¹

Besides the resident members in Penzance and its immediate neighbourhood, we observed many of the most respectable Gentlemen from distant parts of the county. The Meeting was also honoured by the presence of several distinguished strangers, well known in the Mineralogical world. Among these were Mr Sedgwick and Mr Gilby, both Fellows of Trinity College Cambridge: the Rev Mr Conybeare, Professor of Poetry in the University of Oxford, Mr Serle, Dr Clarke, &c. The gallery of the Museum was much crowded with ladies... Among the ladies present was the famous mineralogist Mrs Lowry of London, whose private lessons in mineralogy are so much esteemed by the scientific world.

At some meetings the "distinguished" visitors were persuaded to make a contribution; for example in 1836, when William Buckland gave a talk on an ichthyosaur belonging to the society:²

Repeated bursts of applause followed some most humorous remarks, incidentally made; and we are sure few, if any, of the numerous auditory but were instructed as well as diverted by the admirable mixture of philosophy and wit with which Dr Buckland obliged them.

A report in the West Briton, about the first of a series of chemistry lectures given by Dr H S Boase in 1822, suggests that the audience was there chiefly for entertainment rather than instruction, even when there were no celebrities to draw them:³

That large room [in the RGSC building], and its spacious gallery, was filled by a numerous and genteel auditory, who expressed much satisfaction with the matter and manner of this introductory lecture.

The presence of ladies at meetings, especially at the Anniversaries, is also an indication of the entertainment element

of the proceedings, for ladies were not eligible for membership, although they were welcome as the guests of members. In 1821, for example, the Royal Cornwall Gazette reported that at the Anniversary Meeting: "Most of the gentlemen in the west of Cornwall who patronise the institution were present; and the meeting was, as usual, honoured by a numerous company of ladies."⁴

Science could also be seen as a more desirable alternative to drinking and gaming, activities not just restricted to the lower classes in Cornwall. In Penzance there were people who welcomed the opportunities promised by the geological society, as providing a real alternative to the social activities already available. It is probable that the few members who belonged to Methodist groups, and to the Society of Friends, would have been especially enthusiastic about such a source of culture, because of their encouragement of educational pursuits. The quotations from the "Memoirs" of Henry Boase on pp.18 and 26 show what hopes he had of the new society. The Rev William Turner had had similar expectations of the Newcastle Lit and Phil:⁵

Might [societies] not be expected to increase the pleasures and advantages of social intercourse, by providing an easy method of spending the evening agreeably and usefully; and may not they thus be a means of checking the first formation of dissipated habits; of banishing from our tables the coarser pleasures of intemperance; and of substituting for the always trifling, and frequently destructive, pursuits of the gamester, the rational and manly entertainments of literature and philosophy?

The meetings of philosophical societies were also occasions when men with different political interests could meet without the need to get involved in matters of politics, as this

subject, together with religion, was invariably banned from discussion in learned societies. There was no such clause in the Laws of the RGSC, but there and in the RCPS, Tories such as Davies Gilbert and Sir Richard Rawlinson Vyvyan would meet with Liberals like Lord De Dunstanville and Charles Lemon without antagonism.

Another reason for establishing a scientific society would have been to promote useful knowledge. This latter aim can be subdivided, since it should be asked was the idea to increase knowledge absolutely, (ie. to encourage original research), or was it to increase the scientific knowledge of participants, (ie. a exclusive form of adult education), or was it to provide instruction for those who were not members of the society. It will be argued that the RGSC attempted to encourage original research, and did provide scientific lectures for its own members, but instruction for others, especially the mining community, was not successfully pursued.

The first Patron of the RGSC had few doubts about the way in which the society should proceed. Lord De Dunstanville was the principal lord in the county, and a rich landowner who derived much of his wealth from Dolcoath mine, near his estate at Tehidy. He was also noted for his benevolence, especially towards the miners, and at his death in 1835, there was genuine mourning in Cornwall.⁶ At the society's first Anniversary meeting, in September 1814, he had admitted that he knew little of geology, but had used the following words to explain his reasons for wishing the society every success:⁷

...he knew no greater pleasure that could be enjoyed by those on whom Providence had bestowed a large share of temporal blessings, than to increase knowledge and foster science by aiding the labours of others, in a manner so easy to themselves and at the same time, so effectively productive of advantage and improvement. ...he should at all times be ready to assist [the society's] views, which promised so much real improvement to the science, and as he might add, the wealth and resources of a County, in whose interests he was naturally and most zealously concerned.

He therefore saw at least some of the new society's aims as utilitarian, but also recognised that the members themselves would benefit from the enjoyment of participation in its activities.

Paris also used utilitarian arguments, when he spoke to the nascent society:⁸

Geology... whether viewed as an abstract Science, or with reference to the number, and importance of its applications, was equally a subject of singular interest...

...it must be confessed that however interesting a science may appear in the closet, that it could never become generally popular, unless it were capable of an immediate application to some one of those Arts which were subservient to the comfort or elegance of Life.

As Editor of the first Volume of the society's Transactions, a task which he finished after his return to London in 1817, Paris described how he saw the society's involvement in original research. He wrote in the 'Preface':⁹

...the benefits which such an Institution is capable of imparting to our local interests, by defining and multiplying the objects of economical industry, are not less numerous than those which it will necessarily confer upon Science, by collecting, arranging and generalising instructive facts...

The Council humbly conceive that the labours of the Society are devoted to the accomplishment of two great purposes, intimately related, and mutually subservient to each other - THE DISCOVERY OF NEW FACTS TO ENRICH SCIENCE, AND THE APPLICATION OF SCIENCE, TO IMPROVE ART.

Paris's speeches and writings need to read with a degree of

caution, for some of his addresses were largely rhetorical. He was a popular performer; his 'Éloge' on the life of William Gregor, given at the last meeting before he left Penzance, was greeted by the members with "repeated peals of applause".¹⁰ On the other hand, some of the measures which he supported to reduce accidents in mines (see Section 7 below), and his donation of money in 1830 for a prize to be awarded to practical men (see above), suggest that he had a genuine interest in the applications of science. This point will be discussed in more detail in the Conclusion.

Another reason for studying science has been described as facilitating the "social legitimation of marginal men".¹¹ This concept has already been discussed in Section 3.4 in the context of religion, and it has been argued that in Cornwall, it could not be appropriately applied to the majority of members of the county's scientific societies. There is another sense in which the concept might be used. In Cornwall there were families, similar to those in the industrial north of England, who had made considerable wealth from mining or an associated activity. Some, such as the Lemons and Hawkins had achieved status in the eighteenth century with the creation of baronetcies, and the acquisition of land.¹² Others had not yet reached this level of social acceptance, and may have been hopeful that association with the landed gentry and other successful gentlemen might lead to social recognition.

One such family, the Williams of Scorrier, was perhaps the most successful and ruthless in business in Cornwall, and in

terms of religion they appear to have been opportunists. The father John was Methodist, whereas his eldest son had converted to the Society of Friends, and another son, William, was Anglican. Local gossip said of John senior that he would have asked his third son to become a Jew, had that been advantageous to business.¹³ It is difficult to see such a family, for whom business and the creation of wealth were all important, hoping to acquire social recognition through membership of a provincial society, and there is no evidence to suggest that the family used their memberships of the Cornish societies in the way suggested. All the family were passive participants in the activities of the RGSC. Even though John jun was respected as a mineralogist as well as a business man, having been a corresponding member of the British Mineralogical Society, he never read a paper for the RGSC.¹⁴ He was also an honorary member of the Geological Society of London, and a contributor to its Transactions.¹⁵

Other societies had varied motives for promoting science. Of the other two Cornish societies, the RIC was concerned mainly with polite knowledge in its early years. The RCPS was very different, encouraging useful inventions and self-help. It did not ignore polite knowledge however, having classes for art etc, in the annual exhibitions, and it acceded to demands for popular lectures in 1841.¹⁶ The Pottery Philosophical Society was another institution mainly devoted to useful knowledge,¹⁷ as was the Yorkshire Geological Society, at least in its early years.¹⁸ Some members of the Newcastle Lit and Phil were very much concerned that it should become involved in the problems of the area. The Rev William Turner, a Unitarian

minister, thought that members should study the lead and coal mines of the area, not just to locate new resources, but to improve methods of working coal, etc. He also suggested that a statistical survey of the inhabitants of Newcastle should be made. His ideas did not necessarily meet with the approval of all of the other members, for the society's library became the most important part of the institution's facilities.¹⁹

4.2 The methods proposed for the advancement of science

4.2.1 Original research

At the founding meeting of the RGSC, Davies Gilbert, thanking the members for electing him as their President, made a very short speech, perhaps reflecting his preoccupation with his father's health (see Section 2.4). He did however echo the Baconian ideas with which the Geological Society of London had been founded, and of which he was already a member:²⁰

It was from Societies thus instituted for the collection and communication of knowledge, that the illustrious Lord Bacon foretold the surest road to improvement would be found; and the great benefits which had arisen from our Royal Society, and the Institutes abroad formed precisely upon the Model recommended by that great man, had amply proved the propriety and wisdom of his suggestions.

It seems that Gilbert may have seen the Cornish society as a copy of the London one, and that its predominant concern should be with original research. He would have hoped that, with so many members, much useful information about the mines and the local geology could be collected. The society did have plans for co-operative research in connection with a proposed map of Cornwall; this topic will be discussed in

Section 5.

The Code of Laws, prepared by Paris and published later in 1814, gave more clues about the intentions of the new society.²¹ Two committees were to be set up; the Chart Committee, whose objective would be to "construct a series of charts, illustrative of the geology of the Cornish coasts", and the Committee of Nomenclature, to "collect all the provincial expressions which are connected with mineralogy". The Chart Committee will be discussed in Section 5. The Committee of Nomenclature appears to have achieved nothing, even though six men were appointed to serve on it in March 1814, for these were the sole references to it in the society's records.²²

The conduct of meetings was also set out in detail in the Laws; at monthly and quarterly meetings, after the administrative business had been dealt with, the following procedure was proposed:

6. Communications read.
7. New facts announced by any members.
8. Dissertation read.
9. Dissertation discussed.

These details imply that it was anticipated that original research on the geology of Cornwall would be presented in the form of "dissertations". The rules of the society also contained details for the conduct of the annual Anniversary Meetings:

At this meeting, one of its members appointed by the President, shall deliver an oration, in which he shall be required to take a view of all the important geological discoveries which have been made in any part of the world, in the foregoing year; and he shall deliver a comparative statement of the condition of the Mines in Cornwall. At this meeting, the most important and interesting

communications shall be selected, and published in a volume, under the title of the Transactions of the Cornwall Geological Society.

The minute books of the RGSC show that there do not seem to have been many "orations" delivered at meetings on the lines suggested above, perhaps because the amount of new knowledge could not be encompassed in one speech. From 1817 onwards however, annual statistics for the production of copper and tin were presented each year, at first by Joseph Carne, and later by both Carne and Alfred Jenkin.²³ Later sections will include discussion of some of the contributions made by the members of the RGSC to original research in geology and allied subjects.

By the 1840's the society was beginning to realise that there were great problems in maintaining original research in an isolated part of the country away from the main stream of geological activity in London. In 1846, in his Presidential Address to members, Sir Charles Lemon welcomed Sir Roderick Murchison to the Annual Meeting, and said:²⁴

He knows that we are only the auxiliaries of science, and that no provincial society can be more. We may forage for the grand army and render them subordinate services, but we are not competent to lead ourselves or others. He that would teach must first learn all that has been taught, and few amongst us have leisure for so large a study; some of us are engaged in professional pursuits, and some in public life with all its multifarious occupations...

Some other societies also had plans for original research, the most important being the Geological Society of London. The RCPS had slightly different objectives, as it was hoped, through its exhibitions and the prizes which were awarded, to encourage inventions and innovations. Two of the projects

which the society supported were the search for a safe alternative to tamping, used when blasting rocks, and the collection of statistical information about the health of the mining community (see also Section 7). The RCPS tried to resist the temptation to become a scientific society in the mould of the Cornish and other provincial societies, but as will be shown, some of the research by Robert Were Fox on the origin of mineral veins was published in its Annual Reports.

The two Newcastle societies, and the Manchester and Yorkshire Geological Societies, also devised projects to collect information about the mining and geology of their own areas. The Newcastle Lit and Phil had problems encouraging its members to take part in research; according to Middlebrook, "from the first the supply of original papers had been sporadic and scanty and the number of contributors extremely limited".²⁵

4.2.2 Lectures and lecturers

Many societies embarked on lecture programmes for the benefit of their members, but no provision was initially made in the RGSC for tuition in geology. In 1816 however, Robert Bakewell came to Cornwall, and gave at least two series of lectures in geology, the first at Penzance. It is not known whether he came at the invitation of the society, for there was no reference to his visit in the Minute Book, but he did make use of the society's Museum. This would however have been the only possible place for public lectures in Penzance at this time, as even Penzance Town Council used it for some of their meetings.²⁶ The lectures were afterwards repeated in Truro.²⁷

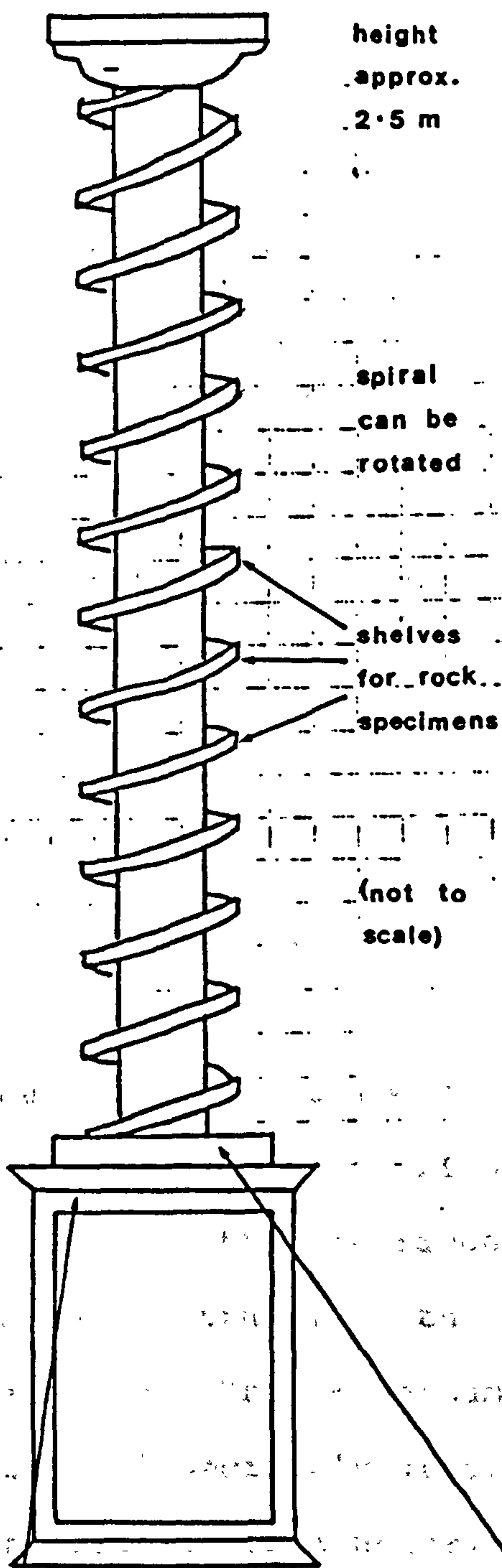
Paris had promised at the society's initial meeting that he would give some lectures in chemistry,²⁸ and he kept that promise in the spring of 1815, with a series of 20 lectures.²⁹ In February 1815 it was recorded in the Minute Book that the society had bought a Voltaic battery of 120 pairs of plates, and this was used by Paris to demonstrate the latest discoveries in electricity.³⁰ He also made an attempt to relate some of the chemistry to geology. The West Briton reported on the 3rd of February 1815 that "The earth's metals, their natural history, follow next; the application of chemistry to smelting. It is to be hoped that advantage will be derived to the mining interests from this part of the course".³¹ In his final lecture, Paris "apologised for any deficiency which might have arisen from his not having previously directed his attention more particularly to those branches of chemistry which related to mining".³² Despite this "deficiency", the lectures were well received; a hundred tickets were reportedly issued for the first lecture,³³ and after the completion of the series, Paris was awarded with a piece of silver plate in gratitude for his efforts.³⁴ Dr H S Boase also gave two series of chemistry lectures in 1822 and 1824; the second series was a repeat of the first which had been very popular.³⁵

In the winter of 1815 to 1816, Paris gave three papers to the society on "a new system of geology".³⁶ Only the titles of the papers were entered in the Minute Book, and they were not printed in the Transactions, nor were they reported in the

**DIAGRAM ON THIS
PAGE EXCLUDED
UNDER INSTRUCTION
FROM THE
UNIVERSITY**

FIGURE 11
ROYAL GEOLOGICAL SOCIETY
OF CORNWALL

GEOLOGICAL PILLAR
presented to the Society
in 1817



ON PLINTH

HOC STUDIUM
GEOLOGICUM

J. A. PARIS Invenit ac posuit
MDCCCXVI

LETTERING
On pillar

VOLCANIC

FRESH
ALLUVIAL

ALTERED
MARINE

FLOETZ
OR
SECONDARY

TRANSITIONAL

PRIMITIVE

LETTERING AT BASE OF SPIRAL

On spiral

Pseudo-volcanic product, &c, &c

Brecchias

Tufa & Volc^s

Obsidian

Pumice

Lava

Regenerated granite &c

Recent sandstone

Coral

Calcareous tufa

Debris of rocks

Strata contained in the Chalk
basins of London, Paris &
the Isle of Wight

Floetz trap or basalt

Independ coal

Chalk

Third sandstone or freestone

Second Flo² or shell limestone

Second Flo² gypsum

Variegated sandstone

First Flo² gypsum

First Flo² limestone

Old red sandstone

Trⁿ flinty slate

Trⁿ trap

Transⁿ limestone

Grey-wacke

N^r serpentine

Syenite

N^r porphyry

O^r flinty slate

Gypsum

Quartz

O^r serpentine

P^e limestone

Prim^e trap

O^r porphyry

Clay slate

Granite

Gneiss

Mica slate

newspapers. It is possible that he used his 'Geological Pillar' in his explanations, for this was presented to the society in 1817, and still survives (see Figures 10 and 11).³⁷ Paris's geological ideas will be discussed in more detail in Section 8.

In 1834 an attempt was made by the society to provide some elementary instruction in geology. The Annual Report for that year included the following paragraph:³⁸

It is with great satisfaction that the Council have witnessed, during the past year, the re-establishment of the Quarterly Meetings, as proposed at the last anniversary. On these occasions the doors have been freely thrown open to all visitors without restriction:- and the officers have strenuously exerted themselves to impart instruction by the introduction of elementary essays at these meetings, in the hope of exciting a greater taste for geological pursuits.

The following year however the report was much less encouraging, for the Council had to report that these meetings had been discontinued "in consequence of the uniform non-attendance of the members".³⁹

The RGSC did not always confine its discussions to geology and chemistry. Volume II of the society's Transactions contained a paper by the Rev Samuel Greatheed on the 'Knowledge and commerce of tin among the ancients', and Volume III included a paper by Dr T F Barham on antiquities in Cornwall. In May 1817, immediately after newspapers had been preoccupied with the details of a notorious poisoning case, Paris gave a paper on 'The different tests for the discovery of the presence of arsenic'. He began his paper by explaining:⁴⁰

...that since the extraordinary and notorious trial at the Lent Assizes his opinion had been so repeatedly solicited upon the subject of Arsenical Tests that he felt it his duty to offer the present paper as an answer to them; it afforded

him also an opportunity of communicating to the Society a simple method of so modifying the ordinary experiments, as entirely to avoid those fallacies which had been attributed to them.

It is fairly clear from contemporary accounts that most of these lectures were given for reasons of popular entertainment; there was no provision in the context for artisans or the labouring classes. The cost of a ticket to one of Bakewell's lectures at Truro was 4/-, or one guinea for the whole course, too high a cost for a working miner.⁴¹ A review of Bakewell's lecture series suggests that they were intended to amuse and interest:⁴²

The beneficial effects which the establishment of our Geological Society is likely to produce, we have often noticed, and we are of the opinion that Mr Bakewell's lectures, in as much as they may excite and diffuse a taste for the science of geology, may considerably assist its laudable exertions, and therefore, they have a considerable claim to the patronage of this county, which we hope Mr Bakewell will experience at Truro.

The President of the RGSC, Davies Gilbert, would not in any case have approved of educating the miners. In a speech to Parliament in 1807, he had said that education would be "found to be prejudicial to their morals and happiness; ...instead of teaching [the labouring classes] subordination, it would render them fractious and refractory...".⁴³

Unlike the RGSC, some societies planned to hold lecture series from the start, although usually only for the benefit of their own members and their guests. The RIC appointed five Vice-Presidents, each with a special responsibility for a particular range of subjects (mechanics, pneumatics and aeronautics, experimental philosophy and natural history, history,

biography and antiquities, and fine arts). It was a part of their task to organise lecture series in their own topics. The first series of lectures was given fortnightly in the winter months of 1819-20, most of the lectures being given by the Vice-Presidents themselves.⁴⁴ There were problems in maintaining a regular programme, caused partly by a shortage of money, for by 1828 the RIC had started an appeal to raise funds for its own building.⁴⁵ In 1838, "monthly scientific discussions" were again commenced.⁴⁶

The RCPS did not initially propose to provide lectures, but was eventually persuaded to do so. The first series began in the winter of 1841, with lectures on chemistry by Robert Hunt, and on literature by John Sterling.⁴⁷ Although the lectures were popular, the society had problems sustaining a regular programme, partly because it was short of money, having decided in 1836 to build its own hall. There also were difficulties in providing regular lecturers and a large enough audience, with such a small population from which to draw them. The lecture programme was "discontinued from lack of support" in 1846.⁴⁸

The Plymouth Institution planned lecture series from its inception, even giving reduced subscriptions to those who were prepared to take part in the programme (see page 68). This must have been a successful ploy, as not until 1837 were problems about shortages of lecturers reported.⁴⁹ In the first series, 12 out of a total of 21 lectures were on scientific subjects.⁵⁰ The Newcastle Lit and Phil began to hold

regular lectures in 1798, "with the intention of fostering the advancement of scientific knowledge".⁵¹ The Pottery Philosophical Society, founded in a socially isolated area, planned to hold regular weekly lectures or demonstrations, all to be given by its own members.⁵² The Yorkshire Geological Society tried to attract important names in geology as speakers, including John Phillips and J F W Johnston, but did not hold regular lectures.⁵³

The Geological Society of London had not initially included lectures in its programme, believing that its function was to encourage original research. At an early stage it began to realise that many of its members were ignorant of some of the basic skills in geology, and started giving elementary lectures in the 1810's. Later, as the society developed into a forum for the cognoscenti of the geological world, these lectures became unnecessary and were discontinued.⁵⁴ The Manchester Geological Society, like the Penzance and London societies, did not originally plan to provide lectures, but realising that it should accept some responsibility for the working miners of the district, decided to hold classes "to instruct [them] in the use of the Davy lamp and in the nature of the explosive gases". These lectures were given at collieries by Francis Looney FRS, and became most popular, with attendances of over 300, "of whom a large proportion were working colliers".⁵⁵

Although some members of the RGSC had intended that its main objective would be to concentrate on original research, a proposal was made by the Council in the spring of 1817 to

establish a Professorship of Mineralogy, whose principal function would have been as a teacher. It is fairly clear that this post was intended for Paris, in order to dissuade him from returning to London. In September 1816 he had been re-elected as secretary, but as a temporary measure for, in the President's words, "he understood that gentleman intended to quit the county".⁵⁶ A letter, from Ashhurst Majendie to the Rev John Rogers written in June 1817, also gave a idea of Paris's intentions: "Dr Paris is still in London to which place I believe he will certainly move from Penzance unless a salary can be attached to a Professorship as the practice of that district is really too insignificant".⁵⁷ After Paris had returned to London in October 1817, he wrote to Henry Boase: ".as to professional success much more than my most sanguine hopes could have anticipated, I have been one month in my temporary residence, and during that period I have taken a greater number of fees than I ever did in Penzance during a similar interval".⁵⁸

The proposal to appoint a professor appears to have been discussed in some detail, although not at RGSC meetings, as there is no record in the minute books of the matter before the Quarterly Meeting held on the 17th of February 1817. An "inner circle" of men who seem to have been responsible for much of the detailed organisation of the society may have been involved in these discussions (also see Conclusion). There are few clues to the originator of the idea, but Sir Rose Price, a close acquaintance of Paris, is one possible candidate (see also Section 7.1 which includes details of co-operation between Price and Paris over a safety tamping bar

for miners). In January 1817, Henry Boase had written to Price about the proposal, saying:⁵⁹

Of the expediency of securing to the mining District of this County, the residence of a man of talents and science, I believe that you, Sir, are convinced;...

At a meeting of the Council held in February 1817, at which Price was Chairman, the reasons for proposing such a post and a full description of the responsibilities of the person to be appointed were discussed and recorded:⁶⁰

Resolved - that the increasing importance of the Society, and the extent of the objects which it embraces require the first rate talents and science to conduct it, and that the only way in which they can be commanded, is by the establishment of some office with an appropriate salary.

Resolved - that a Chair for a Professorship of Mineralogy and Geology should be established and that a salary should be provided corresponding with its dignity and importance, under the title of Professor of Mineralogy and Geology to the County of Cornwall: that the same should be in the appointment of the Society.

It is further resolved - that the duties of the Professor shall be as follows:- viz

To conduct the Society (according to laws provided for that purpose) and to answer all domestic and foreign correspondence.

To read a course of Six Lectures on Mineralogical Science &c, in every year at three of the towns, situated in the Mining Districts (making a sum total of 18 lectures annually) and also to read a Course of 12 or more Lectures to pupils recommended and sent to the Town wherein he resides, and also to analyse any unknown mineral substance that may be sent to him, and to perform any other scientific service which he may at any time be called upon by the Society to execute.

Careful reading of these proposals makes it clear that the first priority of the RGSC Council was to keep Paris in Penzance, by offering him a salary and status. The status of the society itself was also emphasised. There was however scant detail about the intended audience for the proposed lectures,

or about the pupils to be sent to Penzance for tuition.

The Council also devised a method of funding the post:⁶¹

Resolved - that in order to raise a fund for this purpose, it be strongly recommended to the Proprietors of Copper and Tin Mines to allow the trivial charge of One Penny per Ton on Copper Ore and One Penny per Block on Tin, to be retained by their agents, and paid over to the Professor for the time being, and it is hoped that a charge so small in itself, and so widely diffused as to be unfelt by any individual will be esteemed a small price for so great a benefit.

The salary intended for the new professor was to be £400.

Copies of these resolutions were sent to eight members of the society, all owners of copper or tin smelting works, and they were asked to send their opinions to the society. By the 7th March, the deadline given, only one reply had been received, from G C Fox of Falmouth, and that was unfavourable. He wrote:⁶²

Although I feel a sincere desire for the prosperity of the Institution, I cannot presume to hazard a decided opinion on the proposed measure, because being reluctant to oppose any plan which may have appeared advantageous to the Council, I at the same time consider that an individual ought not, unless acquainted with the general sentiments of the mining interests to recommend the imposition of the smallest burden on the mines; particularly at a period when many of them are from the low price of copper in a very critical situation.

There were no further references to the Council's plan in any of the Minute Books, so it must be presumed that the proposal was eventually dropped, for lack of support. It was indeed an unpropitious time in which to ask for financial help from the county. The prices of both copper and tin had been falling ever since the high point in 1814 (see Figure 2 (p.9) and Appendix 2). In addition, the first imports of tin ore from Banka in the East Indies, of a better quality than much of

that from Cornwall, had begun in 1816.⁶³ Sir Christopher Hawkins had written to his brother in 1816:⁶⁴

The low price of copper, and still sinking, and likewise of Tin in this county, has reduced the mining interest very low and I am obliged to make great sacrificizes [sic] to keep up my mine at W'l Friendship.

Henry Boase still persisted however. At the Anniversary Meeting in September 1817, when Paris finally tendered his resignation and his successor took over, Boase read a paper about Richard Trevithick's intended work in Peru, which he concluded with the following words:⁶⁵

...it will be the cause of regret to the Members of this Institution, that it may still be said, 'Cornwall has no school of mines - no professors chair - no suitable encouragement to promote the pursuit of mineralogical science.' Shall we wait to be taught the value of such establishments by the half-peopled, half-civilised wilds of America? - I hope not.

The idea of a school of mines was not new, for the mining Academy at Freiberg in Saxony had been started in 1766, and the French École des Mines was created in 1783, and reformed during the Napoleonic Wars.⁶⁶ However no similar school had been started in England. In May 1817, a paper by John Henry Vivian was read at the Quarterly Meeting of the RGSC, entitled: 'A sketch of the plan of the Mining Academies of Freyberg and Schemnitz'. He wrote that he intended to "point out...the useful and objectionable parts" of the plan, in order to help the society with their establishment of a Chair of Mineralogy. Vivian's paper was also published in the first volume of the Transactions of the RGSC. In the introduction to his paper he wrote: "The establishment of a mining academy in the County of Cornwall has ever been a favourite scheme of

mine".⁶⁷ He also offered to present his collection of minerals "formed at Freyberg immediately under the eyes of Werner", should the proposals be successful.⁶⁸ He had already donated a similar set to the Geological Society of London.⁶⁹ The RGSC never got its set of minerals, and they were eventually given to London University; Vivian wrote to the West Briton in 1838 explaining he had done this because: "This plan, like many others, fell to the ground".⁷⁰

There was never again any proposal by the RGSC to establish a lectureship, although the society was always happy to commend the efforts made by others. In the Annual Report of the society for 1825, mention was made of a plan which had been put forward at a meeting at Redruth, by John Taylor of the Geological Society of London, and published in a number of newspapers, including the Cornish weeklies.⁷¹ The report of the RGSC Council included the following comment:⁷²

An account of this proposed undertaking [for a School of Mines in Cornwall] has been presented to the Society by the Author, and he herein invites a free discussion of the subject. The Council rejoice at the prospect of this County being the first to obtain a School of Mines, the want of which has long been amongst foreigners a reproach to the Country at large;...

An attempt by Sir Charles Lemon to fund a school in Truro in 1839 met with a very similar response:⁷³

The Council congratulate the Society on the accomplishment of this most useful and desirable object [the Academy of Mining] by the munificence of Sir Charles Lemon, Bart., and on the ability and reputation of the Gentlemen who have been selected to carry it into operation. Its establishment is, however, too recent to admit of an opinion as to its adaptation to the wants of our labouring population: still the Society cannot allow the completion of one of the earliest wishes of its founders to pass without an expression of their most ardent hopes for its success.

In 1853, at the instigation of Robert Hunt (Keeper of the Mining Records Office in London), the Secretary of the RGSC, R Q Couch, was persuaded to call a joint meeting of the Secretaries of the three senior Cornish Societies to consider starting a school of mines in Cornwall on the model of the one opened in London in 1851. A public meeting was held in Truro in November 1853, and a Committee was set up.⁷⁴ This plan failed, partly because of differences about the function of the school, but mainly because of a shortage of funds. The RGSC played little part except for arranging the initial meeting of secretaries.

In 1877, the basement in the newly opened building of the Geological Society was fitted out, and made available to "Mr Barnett and Mr Corin", so that they could hold chemistry classes for young mining apprentices.⁷⁵ The basement continued to be used until 1891, when the classes moved into a bigger and better home in Morrab Road in Penzance.⁷⁶ The society was proud to give details of the successes of the students in its Annual Reports, but took no active part in the process of their education.⁷⁷

Other institutions in England also made proposals for some form of permanent lecturership, though few were so ambitious as to suggest employing a professor. In 1802 at the Newcastle Lit and Phil, a proposal to found "the New Institution for Permanent Lectures" was made by Mr Thomas Bigge, to be a "Lectureship on Subjects of Natural and Experimental Philosophy. &c", which was intended to benefit "the miner, the

mechanic, the manufacturer, and the agriculturalist". It was made clear that the classes were not to be "elegant discourses which should enable the dilettante to amuse an idle hour". In 1803 the Rev William Turner was appointed to the post, and he subsequently gave one or two courses of lectures a year.⁷⁸ The Pottery Philosophical Society, having found that its initial lecture programme was successful, decided in 1820 to appoint a permanent lecturer. He was William Henley, one of the members. He was to be paid twenty guineas a year for a course of twelve lectures, but a year later, because of shortage of money, this plan had to be discontinued.⁷⁹

4.2.3 Publications, Libraries and Museums

Most philosophical societies published Annual Reports, which included details of their activities, etc. Some also published volumes which contained some of the lectures or papers read to members; these volumes were called Memoirs, Transactions or Journals etc, but were essentially the same. The RGSC intended from the beginning that its research should be published in Transactions, and the first volume appeared in 1818. It seems clear from the statement in the Rules quoted above (see pp.91-2); that the Transactions of the London Geological Society were to be the model. William Phillips, the publisher of the London society's Transactions, also published Volume I for the RGSC. Some members were however concerned that the Cornish society's publications should not be too expensive, so it was agreed that they should be presented in Octavo, rather than the Quarto size of the London

version, intending that some at least of the mining community could afford them.⁸⁰ The cost of Volume I was however 13/-.⁸¹

The society must have hoped that it could publish its Transactions regularly, and include only the best of the papers read at meetings, but this policy was possible only for the first six years of its existence. After that time, the only regular meeting of the year was the anniversary, and therefore the need to select papers diminished. By the 1840's, it was the common practice for all papers on Cornish matters to be included in the Transactions.⁸²

Few records remain to show whether any editorial control was used to select papers for publication in Transactions. However a series of papers is preserved in the correspondence of John Hawkins, which gave details of a minor controversy over a paper by Henry Boase: 'Remarks on the ancient tin trade of Cornwall'. There is a complete copy of the paper (signed "H B 6 Octo 1818") which was read at the Anniversary Meeting of that year.⁸³ In this he argued that there was no evidence that the Phoenicians had ever traded in Cornwall, and that it was more probable that the Gauls of Brittany had bought Cornish tin to transport to the Mediterranean areas. The paper caught the attention of Sir Christopher Hawkins, himself the author of a book on the ancient tin trade in which he had described Phoenician relations with Cornwall.⁸⁴ There is no evidence that he took up his case with Boase directly, but he wrote to his brother John in Sussex, expressing his disagreement, although no relevant letter is preserved. In November 1818 however, Sir Christopher wrote to John:⁸⁵

I received your letter, with your enclosure to Mr Boase which I will forward - you have or ought to have so fully satisfied his doubts by much irrefutable argument on a great public question.

Davies Gilbert wrote to John Hawkins in December 1818 on the same matter, so that it appears this was more than just a disagreement between two authors:⁸⁶

It gives me much satisfaction to find that you have corresponded with Mr Boase on the subject of his paper about the early tin trade of Cornwall. I should have extremely regretted the appearance of such an hypothesis, in our next [Transactions], and I hope that Mr Boase will now be induced to withdraw his paper.

The final letter on the subject, from Sir Christopher to John, suggests that Boase did not give up his fight easily, although the paper never was printed in the RGSC Transactions:⁸⁷

...tho' you have not convinced Mr Boase, as Dr Forbes told me yesterday, you have very much shook the opinion he had entertained...

A second dispute over editorial policy, again involving John Hawkins, will be described in Section 5.3.

Three further volumes of Transactions were presented at regular intervals, in 1822, 1827 and 1832, each containing papers collected over the previous four or five years. Volume V however was intended to be a special one, containing only the work done by W J Henwood in his investigation of the mines of Cornwall (see Section 6.6). Its appearance was delayed time and again, partly because of the difficulty of engraving the many charts and sections of mines which were to be included, but also because Henwood had other responsibilities, as Assay Master to the Duchy of Cornwall.⁸⁸ The Volume appeared eventually in the autumn of 18⁴³~~34~~. The gap of 12 years between Volumes IV and V was detrimental to the society's reputation,

and led some to think that it was nearly inactive. One correspondent to the Falmouth Packet in 1843 described waiting "til our patience is exhausted" for the publications of the geological society.⁸⁹ Even before Volume V was published, the new President of the RGSC, Sir Charles Lemon, had proposed that in future all papers thought worthy of publication should be printed with the Annual Reports and circulated annually.⁹⁰ This proposal was agreed, and the sixth and subsequent volumes were compilations of the 'Reports' and papers, which had been distributed each year.

The RCPS also published papers, but these were appended to its Annual Reports; the cost was kept very low, at 1/-, in order that they could be afforded by miners.⁹¹ The RIC published Annual Reports from 1818 onwards, which included abstracts of some papers; from 1838, papers were included in its Journal.⁹²

The published Rules of the RGSC also included details of a "Mineralogical Cabinet and Library" which were to be established. Most institutions had similar plans, and the majority rented or built premises to house their museums and libraries. An exception was the Yorkshire Geological Society which realised at an early stage that the cost of housing and maintaining a museum was too great; the contents of its museum were donated to the Leeds Phil and Lit, and the meetings of the society became peripatetic.⁹³ Books and mineral specimens etc, which had been donated or bought by societies, were intended to provide instruction and amusement for members; some institutions also opened their museums to the public. The museum of the RGSC was not initially opened to all, but the

"scientific stranger" was welcome to inspect the specimens if he was accompanied by a member of the society.⁹⁴ Further discussion of the role of the museum and library will be found in Section 8.

4.3 Science as an aid to religious belief

In England at the beginning of the nineteenth century, geology was linked with religion in the minds of some people. A phrase from James Hutton's Theory of the Earth (1795), that he saw "no vestige of a beginning, - no prospect of an end",⁹⁵ led some men mistakenly to think that Hutton had sought to promote atheistic ideas.⁹⁶ The attacks of the "scriptural geologists", such as Kirwan and De Luc, on this aspect of Huttonian teaching brought the conflict to the attention of the public, although mainstream geology was rather more remote from the controversy. Nevertheless the promoters of the RGSC must have realised that some form of reassurance was necessary to those who might have been troubled by these implications.

At the founding meeting of the society, the Perpetual Curate of Penzance, C V Le Grice, was one of the speakers, and he was also elected as an officer, the Librarian. He used part of his address to argue for the propriety of a geological institution, and sought to dispel any doubts that potential members might have had about studying the science because of the current arguments about religion and geology. He said he:⁹⁷

...rejoiced as a member of the Sacred Profession at the formation of this Institution - all knowledge, said he, rightly directed, led us to God - the clearer the views of

the wonders of the creation, the more the veil is lifted from our eyes, the more humble and heartfelt would be our adorations.

Paris also referred to the connections between geology and religion at this meeting, suggesting that faith was more likely to be confirmed through studies of the history of the earth:⁹⁸

[Geology] seemed capable of bursting the limits of time, as astronomy had done those of space, and of unveiling the traces of those various, and awful revolutions, which had convulsed the surface of our globe in its infancy, and anterior to the existence of all nations. In this point of view, the theologian was much interested in the enquiry, for he was thereby enabled to confirm through reason, the truth of that which he already believed through faith, from the very source, from which scepticism had borrowed her keenest weapons, and thus might it be truly said of him, that he sharpened his sword in the forges of the Philistenes [sic].

An issue which was sometimes raised in meetings and papers was the idea that local catastrophes had occurred, which had altered the topography of parts of Cornwall. There are parts of the county where a sudden inundation by the sea was thought to explain the geological features; the sand dunes on the north coast, some of which had at times overwhelmed churches and kept them hidden for centuries, were one such example. H S Boase had no doubt that some of the earlier dunes could be attributed to Noah's Flood. He wrote in 1826, in his paper 'On the sand-banks of the northern shores of Mount's-bay', that "Geology has confirmed the Mosaic account of the Deluge".⁹⁹ The ideas of William Buckland about evidence for the Deluge were also accepted by Joseph Carne and W J Henwood in their examinations of stream tin (see Section 6). Buckland had attributed the stream tin deposits of Cornwall to the Deluge in Reliquiae Diluvianae in 1823.¹⁰⁰

Robert Were Fox in some of his early papers also showed how he saw the connection between religion and geology. He described the work of the Deity as operating inside the earth, as well as above it, making use of the argument from design. In the Philosophical Magazine for July 1829 he wrote:¹⁰¹

Geology had perhaps hitherto been considered too much as an insulated science; whereas, I believe that the phenomena it embraces are only additional links in the chain of creation, so ultimately connected in all its parts. Otherwise it must be admitted to present an anomaly when compared with the other works of the Deity, in the minutest portions of which, order, wisdom and reciprocal dependence become more and more evident in proportion as they are investigated.

And in 1830 in the Philosophical Transactions he included the following words: "my object is, rather to suggest whether the arrangement of veins, &c, does not argue design, and a probable connection with other phaenomena of our globe".¹⁰²

In his major paper 'On mineral veins', given to the Polytechnic Society in 1836, he used his concluding paragraph to sum up his beliefs:¹⁰³

There is, nevertheless, in all Nature, a harmony of parts, and a consistency of operation, calculated to excite our reverence and gratitude towards her Almighty Author, whose infinite fore-knowledge and goodness thus forcibly manifest themselves, in the perfect adaptation of physical laws to every existing circumstance.

John Hawkins gave some indications of his beliefs in natural theology, in a paper read in October 1821, when he advised the members of the RGSC of some of the advantages which Cornwall had for the study of geology; he wrote:¹⁰⁴

The study of the little planet which we inhabit... appears to be one of the most rational employments of man during his short existence. There is no purer source of intellectual pleasure, and scarcely any thing which raises our concep-

tions so much of the Almighty Creator.

But on the whole there were few direct references to religion, either in published papers, or in the records of meetings. This may have been because much of the discussion bore little relation to religion; only when a topic such as the diluvial deposits was under discussion was the subject raised. Many of the subjects included at meetings were less directly relevant to religion; for example the apparent absence of fossil remains in the county meant that there was no discussion of ideas about evolution. Although some of the ideas implicit in the new geology, especially the antiquity of the earth, were unacceptable to certain nonconformists, Methodists were less concerned with detailed theological arguments, for their faith was evangelical and founded on emotion.¹⁰⁵ As has been shown, Methodism was the only significant dissenting sect in Cornwall. It is also possible that there were conscious decisions to avoid matters which might have been controversial in order not to give offence to those who might hold strong views on such topics. This had been the policy adopted by the Geological Society of London.¹⁰⁶

4.4 Science as an aid to mining and other industrial interests

Most of the societies discussed above included in their aims some provision for assistance with, or research into, the problems of local industries. At the beginning of the nineteenth century the distinctions between the sciences and the arts (technology) were not as finely drawn as they are now, so

it was quite acceptable to include aid for industry among the objectives of a scientific society. In Cornwall the major local industry was the mining of metallic ores, and all three of the Cornish societies paid attention to this important source of wealth. The RGSC, being a geological society, inevitably gave special attention to the tin and copper mines; however very little interest was shown in the china clay industry in the early days of the society, perhaps because the its home was in the far west of Cornwall, away from the main china clay producing area around St Austell.

What specifically were the aims of the RGSC with respect to mining, and what did the society hope to get from the industry? It is clear from reports of the early meetings that there was great interest in the location and origin of mineral veins. Part of the interest was due to theoretical curiosity, but there was also an obvious financial involvement. The minutes of the first monthly meeting, held on March 4th 1814, recorded that "some discussion took place upon the manner in which lodes were heaved by cross courses"; a resolution then followed, that the history and structure of lodes should be a topic for the next meeting.¹⁰⁷ Section 6 below will include more detail of the work done in the RGSC, and in the Polytechnic Society, on the origin of mineral veins.

John Hawkins, in one of the first papers he wrote for the RGSC 'On a process of refining tin' (1817), introduced it with an explanation of the reasons why he thought a practical subject appropriate for the consideration of members. He explained that the information would have "remained in obli-

vion":108

...had not I been informed that the attention of this Society was by no means exclusively directed to an object (the mineral history of Cornwall) which, under the direction of its zealous and enlightened secretary, it was so well calculated to promote; but that no hint which might be offered for the improvement of the mining and metallurgical operations of this county would not pass unregarded.

The RCPS also had very specific ideas about what it could do to assist the major Cornish industry. In its Annual Report for 1834, the Committee reported that:¹⁰⁹

In a county where the welfare of a great mass of its population wholly depends on the excavation of its subterraneous deposits, which can only be successfully prosecuted through the assistance, which art affords to the natural powers of man; every plan which proposes to render that assistance more effectual, by promoting the improvement of machinery, or by facilitating the operations of the miner, must be deemed pregnant with results, the most beneficial to the community.

The report continued with details of the Premiums which had been offered by Charles Fox for the best method of raising miners from the depths of mines, without the need to climb ladders. The humanitarian interests of the RCPS were always important, but the commercial advantages of improvements were not forgotten.

Societies in the north, in Manchester, Newcastle and Yorkshire, also had mining interests, in coal, lead and iron. They too were anxious to improve their knowledge of the location and formation of mineral deposits. William Turner, in his address to the new members of the Newcastle Lit and Phil in 1793 said that:¹¹⁰

...the origin and chemical properties of coal, the position in which it is found in the earth, the thickness and inclination of its strata,... were curious and interesting objects of inquiry,...

When addressing the prospective members of the new Natural History Society of Northumberland in 1829, the same William Turner spoke in much more specific terms:¹¹¹

The importance of Mineralogical and Geological Knowledge, to all persons engaged in mining operations, will be apparent when we consider the immense sums of money which have been lost, even in this district, in a fruitless search for coal and metallic ores, in situations where a slight Geological knowledge would have taught that none was to be expected.

The members of the Yorkshire Geological Society, most of whom were mine owners, had similar ideas about the objectives of their society. Morrell (1983) argues that most of them were working mines deeper than the average, and would have hoped to use the resources of the new society to collect information which would have made the sinking of new shafts less of a financial risk.¹¹² The Manchester Geological Society had almost identical aims. At its initial meeting in 1838 it was argued that the society would "assist any geologist and miner [to] enable them to predict with tolerable accuracy what is to be found in any locality... and of occasionally being the means of saving sums of money which might be expended in a fruitless search".¹¹³

Another objective proposed by most of the societies with geological interests was the completion of a map of the geology of their respective areas. It was usually intended that these maps should also show the mineral resources, whether they were coal seams or mineral lodes. The history of the plans of the RGSC for a geological map of Cornwall will be discussed in Section 5. Many of the societies also proposed

humanitarian measures which could be applied to mining. The accidents which took place in mines are a particular example, and the contribution made by the RGSC, and followed up by the RCPS, will be dealt with in Section 7 below.

Also of interest to the mining industry were the several proposals to establish some system for collecting mining records. Such proposals were often made because of the disastrous consequences which could ensue if miners accidentally broke through into old unmapped workings. The commonest result was flooding, from the water accumulated in the abandoned mines, and it was a frequent cause of loss of life, and also of expensive remedial pumping. Flooding could even ^aled to the closure of formerly profitable mines. There was also the hope that the old records might give clues to forgotten resources.

A mining records office may have been what Paris intended when, in his speech to the new members of the RGSC, he said that he saw geology helping in the "application of science to practice". He continued:¹¹⁴

Scarcely a day passed without the discovery of some new and important disposition of Strata, or of the Lodes which traversed them. These however were unfortunately never heard of, for want of some well arranged system of Communications, some Repository in which such facts could be arranged and recorded. This desideratum the formation of a Geological Society at Penzance would accomplish.

The RGSC never however took any formal steps to collect mining records. In April 1839 the Polytechnic Society received a proposal from Richard Taylor of the Consolidated Mines of Cornwall that:¹¹⁵

...this Society might afford the Miners of this Country an

opportunity of forming a depository of plans sections and other records of their underground workings, which would provide for the preservation of information of the utmost value.

The meeting accepted the proposal, but there is no evidence that it was ever acted upon. Similar proposals by the Newcastle societies, and the Manchester Geological Society, were equally unsuccessful, and it was eventually left to Sir Henry De la Beche, and the Government, to set up the Mining Records Office in London in 1840.

Other industrial interests pursued by societies included ceramics (the Pottery Philosophical Society),¹¹⁶ and the engineering and chemical industries (Manchester Lit and Phil).¹¹⁷ Agriculture was also of great interest and importance. The RGSC realised that a greater knowledge of soils could be of use to the County's farmers, and it also had the example of Davy's Elements of Agricultural Chemistry on which to draw. Paris's paper 'On the geological structure of Cornwall' in Volume I of the society's Transactions, was first delivered to the Penwith Agricultural Society in October 1815, as 'Notes on the soils of Cornwall', before being repeated at a meeting of the RGSC in May 1816.¹¹⁸ The only recorded chemical analyses performed by Paris were made on soil samples, and were entered in the society's 'Soil Analysis Book'.¹¹⁹

4.5 Local pride

The objectives discussed above were openly proposed and discussed at meetings, and in the reports of the geological

society, but there were other, undivulged reasons for welcoming a learned society in Penzance, and in Cornwall. In the first place, the new society gave status to the town and the county. This may have been one of the reasons for seeking Royal patronage (see Section 2.4), as the society was able to announce its meetings from October 1814 onwards with the 'Prince of Wales' feathers' at the top of the advertisement.¹²⁰

A resolution, passed at the Special Meeting in October 1814 at which the name of the new Royal Patron was announced, is illustrative of the pride which members had in their own county. The resolution as recorded in the Minute Book was amended, and the quotation below shows, in brackets and bold characters, the parts which were deleted from the version published in the local newspapers, perhaps because it was felt that some of the words were too effusive:¹²¹

Resolved - that the warmest thanks of the Cornwall Geological Society be presented to it's [sic] late Patron Lord De Dunstanville, for his very active exertions in the promotion of it's general welfare and in particular, for obtaining the very distinguished honour of the Royal Patronage, which his representation has (alone) procured. That this important service be recorded in our annals, (and transmitted to our **children, and our children's children**), and stand at once, as a lasting memorial of our gratitude and of his Lordship's ardent zeal for science, and attachment to the mining interests of his native county, (which forms by far the most important district in the British Dominions).

Reports, such as one included in the Royal Cornwall Gazette for 1815, also show how the Royal connection could become a newsworthy event:¹²²

Among the late presentations at the Prince Regent's Levee, we observe John Ayrton Paris, of Penzance, the Secretary to the Royal Geological Society of Cornwall who had the honour to present to his Highness a report of the Proceedings of

that valuable institution. Dr Paris was introduced by Lord De Dunstanville.

Henry Boase also referred to the Prince Regent's Patronage in May 1817, in a letter to Davies Gilbert in which he had expressed his concern about the possible departure of Paris to London:¹²³

...I look with perfect confidence to your concern for our infant Hercules, trusting that under your Patronage it will prove not only an honor but a source of great benefit to our County. Sussex may enrich but can never claim the credit of giving a President to the Royal Geological Society; and as first in point of time under Royal Patronage - as best in respect of locality, why should it not be also in merit. "We can't command success - we can deserve it." "Esto perpetua" should be our prayer and our motto.

(The reference to Sussex was to Gilbert's home at Eastbourne.)

In a similar way, the efforts made by the RGSC to promote the use of a safety tamping bar were also used to bring public attention to the society itself. In March 1817, a pamphlet describing the safety bar was brought before a Grand Jury at the Lent Assizes at Launceston (see also Section 7.1).¹²⁴ Part of the reason for this action was to publicise the bar, and to ensure that it would be used more widely, but the society's name was inevitably advertised and favourably connected with the publicity.

After Paris had left Penzance in 1817, a collection was made for some silver plate, which was presented to him in June 1818. The inscription on the plate, reported in local newspapers, shows that the society was not only demonstrating its gratitude to Paris, but was also very aware of its own importance:¹²⁵

'To John Ayrton Paris, M.D., F.L.S., Fellow of the Royal College of Physicians of London, this plate is inscribed by the noblemen, representatives in Parliament and Gentlemen of the County of Cornwall, in testimony of their grateful sense of his services, in suggesting the plans and promoting the institution of the Royal Geological Society of that County, which has rendered their home the school of science and their native riches increasing sources of prosperity.'

In 1842, when a former secretary of the RGSC, W J Henwood, became engaged in a long and acrimonious dispute with the Duchy of Cornwall, the society felt that its own honour was besmirched by the way in which one of its former officers was being treated. At the Annual Meeting in October 1842, the affair was a dominant topic, and afterwards at the Annual Dinner more discussion took place. Joseph Carne, one of Henwood's supporters, was reported as having said that:¹²⁶

He could not but allude to the unworthy treatment Mr Henwood had received from the Duchy, and which was in truth reflected on the Society that had first recommended him [to Duchy employment]... he thought as Mr Henwood had been an old, useful and indefatigable officer, whose services to the Society and to the Duchy of Cornwall, were of the greatest value, the Society could do no less than memorialise His Royal Highness the Lord Warden to continue his salary...

Because the RGSC was the first scientific society to be formed in Cornwall, and was the first provincial geological society to be set up in England, the members had a special pride in its existence. At a time when the future of the society was in doubt after Paris's departure (see Conclusion), local pride in the institution was most probably a major reason for ensuring that it did not close down, since this would have been seen as an acknowledgement that Penzance was incapable of supporting its own society. The existence of a rival society newly formed in Truro was also a reason for ensuring that the Penzance society should continue to flourish.

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2. West Briton, 9th September 1836.
3. West Briton, 22nd February 1822.
4. Royal Cornwall Gazette, 20th October, 1821.
5. Quoted in R S Watson (1897), (35).
6. Royal Cornwall Gazette, 14th February 1835.
7. Minutes of first Anniversary Meeting, 20th September 1814, RGSC Minute Book No.1.
8. Minutes of initial meeting, RGSC Minute Book No.1.
9. Transactions, Royal Geological Soc., Cornwall, I, 1818 (v-vi).
10. Minutes of Anniversary Meeting, 16th September 1817, RGSC Minute Book No.1.
11. Thackray (1974), (682).
12. William Lemon was created a baronet in 1774; he purchased the family estate at Carclew in 1749. Sir Christopher Hawkins owned the Trewithen estate; he purchased his baronetcy through his activities as a borough monger. Baring-Gould (1908), (344-5, 515).
13. Barton (1970), 2, (17).
14. Weindling (1983), (126).
15. H B Woodward (1907), (Appendix). J Williams 'Account of some remarkable disturbances in the veins of the mine called Huel Peever in Cornwall', Transactions, Geological Society of London, IV, 1817.
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17. Shapin (1972), (311-36)
18. Morrell (1983).
19. Watson (1897), (35,38).
20. Initial meeting, 11th February 1814, RGSC Minute Book No.1. Rudwick (1963), (336).
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22. Minutes of Monthly Meeting March 14th 1814, RGSC Minute Book No.1.
23. Transactions Royal Geological Soc., Cornwall, Vol I etc.

24. 'President's Address', RGSC Annual Report, 1846, (9-10).
25. Middlebrook (1974), (9).
26. 'Journal of the Mayor of Penzance' in Collectanea Cornubiensia, (1510).
27. West Briton 9th February 1816.
28. Paris's promise to give lectures was in the Royal Cornwall Gazette 19th February 1814, but not in the Minute Book.
29. For a report of the lectures see West Briton 3rd February 1815.
30. For the purchase of the battery, see minutes of the Quarterly Meeting 17th February 1815, RGSC Minute Book No.1.
31. West Briton 3rd February 1815.
32. Paris's apology was in the West Briton 28th April 1815.
33. A note about the issue of tickets was in the Royal Cornwall Gazette 14th January 1815.
34. Minutes of the Anniversary Meeting 10th October 1815, RGSC Minute Book No.1.
35. West Briton 22nd February 1822, Royal Cornwall Gazette 24th January 1824.
36. The papers were given on 3rd November and 1st December 1815, and on an unknown day in January 1816.
37. The presentation of the pillar was recorded in the minutes for 17th February 1817, RGSC Minute Book No.1.
38. RGSC Annual Report 1834.
39. RGSC Annual Report 1835.
40. Minutes of meeting on 23rd May 1817, RGSC Minute Book No.1
41. Advertisement with prices of tickets in Royal Cornwall Gazette 10th February 1816.
42. Account of Bakewell's lectures in West Briton 16th February 1816.
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52. Shapin (1972), (313);
53. Morrell (1983), (243).
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62. Ibid.
63. Barton (1967), (44).
64. Sir Christopher to John Hawkins, 30th August 1816, British Museum (NH) Library, Hawkins Mss. (Sir Arthur Russell Bequest) Mss. Cup.2 HAW/172.
65. Henry Boase (1818), (222-3).
66. Bryan (1975), (11).
67. Vivian (1818), (71).
68. Minutes of the Quarterly Meeting May 23, 1817, RGSC Minute Book No.1.
69. For the donation to the London society see H B Woodward (1907), (22).
70. West Briton 23rd November 1838. In the 'Preface' to Transactions, Royal Geological Soc., Cornwall, I, (vii-viii) Paris claimed that the collection had already been received, but he must have been out of touch with the society's affairs after moving to London.

71. Royal Cornwall Gazette 7th August 1824.
72. RGSC Annual Report 1825.
73. RGSC Annual Report 1839. For more detail about the various projects to form a school of mines, see Pieterse (1965), (9-14).
74. Royal Cornwall Gazette 18th November 1853.
75. RGSC Annual Reports 1877.
76. RGSC Annual Reports 1890.
77. RGSC Annual Reports 1878-90.
78. Watson (1897), (209-223).
79. Shapin (1972), (321).
80. Minutes of the Quarterly Meeting February 17th 1815, RGSC Minute Book No.1.
81. Royal Cornwall Gazette 22nd August 1818.
82. Abandonment of monthly and quarterly meeting, Royal Cornwall Gazette 14th October 1820.
83. John Hawkins, Letters and Mss. 1790-1827 British Museum (Natural History) Library Mss. Cup 2 HAW ff.84/5.
84. Christopher Hawkins (1811).
85. John Hawkins, Letters and Mss. 1790-1827 British Museum (Natural History) Library Mss. Cup 2 HAW ff.19/20.
86. Ibid. ff.10.
87. Ibid. ff.18.
88. RGSC Annual Reports, 1838, 1839.
89. Letter from "A Member", Falmouth Packet, 14th January 1843 (2).
90. 'President's Address', RGSC Annual Report, 1843 (9).
91. Pearson (1973), (43).
92. RIC Annual Reports.
93. Morrell (1983), (242).
94. Paris (1816), (22).
95. Quoted in Gillispie (1951), (46).
96. Porter (1977), (196-200).

97. Initial meeting, 11th February 1814, RGSC Minute Book No.1.
98. Initial meeting, 11th February 1814, RGSC Minute Book No.1.
99. H S Boase (1827), (181).
100. Buckland (1823), (220).
101. Fox (1829).
102. Fox (1830), (403).
103. R W Fox (1836A), (134).
104. Hawkins (1822A), (12-3).
105. Gillispie (1951), (8).
106. Porter (1977), (202).
107. Minutes of Monthly Meeting 4th March 1814, RGSC Minute Book No.1.
108. Hawkins (1818A), (201-2).
109. RCPS 2nd Annual Report 1834 (9).
110. Watson (1897), (36).
111. Goddard (1929), (30).
112. Morrell (1983), (241).
113. Kargon (1977), (25).
114. Minutes of initial meeting of RGSC, 11th February 1814, RGSC Minute Book No.1.
115. RCPS Minute Book No.3 1839-45 (6).
116. Shapin (1972), (313).
117. Thackray (1974), (696).
118. Paris (1815A), and Paris (1818D).
119. RGSC Soil Analysis Book. There were only two entries, the second of which was incomplete; both were in Paris's handwriting, although not signed by him.
120. Royal Cornwall Gazette 12th November 1814.
121. Minutes of Special Meeting of the RGSC 15th October 1814, RGSC Minute Book No.1.
122. Royal Cornwall Gazette 17th June 1815.

- 123. Copy of a letter to Davies Gilbert, 28th May 1817, British Library Add. Mss. 29 281 f.109.
- 124. West Briton 4th April 1817.
- 125. Royal Cornwall Gazette 27th June 1818.
- 126. Royal Cornwall Gazette 21st October 1842.